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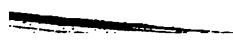
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ABERRATIONS OF *ACIDALIA MARGINEPUNCTATA* AND *A. SUBSERICEATA*.

By LOUIS B. PROUT, F.E.S.



A. marginepunctata.—1, typical; 2, aberration. *A. subsericeata*.—3, typical; 4, aberration.

THE very interesting aberrations here figured were both captured in North Cornwall, by Mr. G. B. Oliver, of Tettenhall, Wolverhampton, during the past summer, and have been exhibited at the meetings of some of our London societies. The specimen of *A. marginepunctata*, a female taken on July 2nd, deposited a very few eggs, and from these three moths were bred at the beginning of September, appreciably darker than the typical form, but not really striking; five larvae persisted in hibernating. The *A. subsericeata* was taken on June 26th, and seems an absolutely unique aberration of this species, which, though somewhat variable, is usually so only within very narrow limits.

A. marginepunctata is well known to be an extremely variable species, and dark local races are by no means unknown; but a practically black specimen like the one figured, which is darker than the photograph represents it, would be an extreme rarity.

everywhere. Its occurrence in North Cornwall, where the normal form (as here also figured), does not seem to be at all exceptionally dark, is all the more striking. The only aberration indicated in Staudinger's 'Catalog' is a *whiter* form (ab. *pastoraria*, Joan.).

It will be observed that the fringes in both cases are paler in colour than in the typical form.

CURRENT CRITICISM.

By W. L. DISTANT.

MR. KIRKALDY is to be praised for the industry with which he pursues his task as reviewer of current entomology, but accuracy is always an advantage, and his last notes in the 'Entomologist' (1906, p. 283), so far as they apply to myself, require reply. In referring to my 'Catalogue of the Cicadidæ,' he writes:—"On p. 146, *Cicada angulata*, Hagen, is cited as a synonym of *Tibicen annulatus*; on p. 168 it is given by Distant as a synonym of *Cicadetta hageni*." This statement is almost a *suppressio veri*! On p. 166 (not 146) I give the synonymy as stated, but on p. 168 I am only referring to a species of which I have no personal knowledge, among others of a similar description, separated by a dividing line, and only quoted as probably belonging to the genus *Melampsalta* (not *Cicadetta*); thus *M.?* *hageni*. Fieber gives as its synonym part of Hagen's species—" *Cicada annulata*, Hag. (nec Brullé,") and I therefore could not refer to the one without the other.

Mr. Kirkaldy's emphatic assertion that "Amyot's mononyms, accepted by Distant, have no place in trinomial nomenclature," is negatived by their employment by Stål, Karsch, and other qualified writers. His further remark, "as is often the case with this author, accuracy of dates seems a minor matter," seems to be an expression of Mr. Kirkaldy's opinion, and therefore concerns nobody but himself.

Mr. Kirkaldy has also referred to a difference of opinion between Dr. Reuter and myself regarding the classification of the Capsidæ, which he says, with perfect accuracy, "the learned Finlander resents." He also gives his decision that my groups are "entirely artificial," and that Dr. Reuter's "are based, as far as present knowledge permits, on philosophical principles." It therefore seems a little surprising that Mr. Kirkaldy should have recently (Trans. Amer. Ent. Soc. 1906) proposed his own classification of the family, rather than follow that of "the learned Finlander," and in which he has proposed a division of some twenty-six tribes. It is only fair, however, to Mr. Kirkaldy to say that, in a subsequent publication of the same year

(‘Canadian Entomologist’), he has made some fifty-six corrections (or, as he describes them, “additions and emendations”) to his paper, and therefore it is an immature publication, and one to which probably he does not desire a too serious notice, particularly as I observe, among some other matters not yet corrected, he has on p. 134 placed the genus *Angerianus*, Dist., in his tribe *Cyclapini*, while on p. 146 he enumerates the same genus under “Genera not described so as to admit of approximate location.”

I take this opportunity to correct myself. In the homopterous subfamily *Cixiinæ* I proposed (1906) the genus *Barma* for an eastern species, and in which I said the *Cixius finitus*, Walk., should also be included. *Barma*, however, must be suppressed in favour of *Borysthenes*, Stål (1866), which was described by Stål in his ‘Hemiptera Africana,’ without type or locality being given. But I overlooked the fact that in a subsequent and other publication he gave the *C. finitus*, Walk., as type of his genus, and that, therefore, settles the question.

ON SOME HYMENOPTERA COLLECTED BY MR. G. C.
DUDGEON AT BUXA, BHOTAN.

By P. CAMERON.

I AM indebted to Col. C. T. Bingham for the species described in this paper.

TENTHREDINIDÆ.

Allantus dudgeoni, sp. nov.

Black; the clypeus, a spot on the apex of the pronotum, broad at the base and incised in the middle there, gradually narrowed towards the apex, and broad bands on all the abdominal segments—the bands on the second and third narrowed in the middle—ivory white; the apical bands darker cream-coloured (perhaps through discoloration); the coxae below and at the apex above, the four front femora and tibiæ below, the anterior tarsi, except the apices of the joints, and the middle tarsi for the greater part below, yellowish white. Wings hyaline, highly iridescent; the radial, fore half of cubital, and the median cellules fuscous violaceous; the apex of costa and stigma dark testaceous, the nervures black; the base of transverse radial nervure running almost parallel with the costa, the apex sloped obliquely like the fourth transverse cubital nervure. ♀.

The male similar, but with the labrum white like the clypeus, and the mark on the apex of pronotum is smaller and triangular, not incised at the apex.

Length, 13 mm., ♀; ♂, 10 mm.

Front in the centre behind the ocelli raised, clearly separated by curved furrows, and bearing a few large scattered punctures; outside the furrows is a smooth space, the rest stoutly, deeply, but not very closely punctured. The front is depressed laterally, and deeply irregularly punctured; there is no frontal area; the lower part is raised, and is closely, distinctly, but not coarsely punctured. Clypeus and labrum sparsely punctured; the apex of the former roundly incised. The third joint of the antennæ is nearly double the length of the fourth. Mesonotum strongly, deeply punctured, except at the apex, where the puncturation is much finer and closer; in the centre the punctures are larger, and interlace. Scutellum sparsely punctured, weakly at the base, stronger towards the apex. Pleurae strongly, closely punctured; the base of the propleurae smooth; the metapleurae finely and closely punctured. Abdomen smooth. Temples rounded, but not narrowed; the occiput margined, not quite transverse. The head in the female is slightly narrower than the thorax; in the male it is almost as wide as it. Except the last, the ventral segments are all broadly banded with yellow. At the bottom, below the hind wings, is a large horn-shaped pale yellow mark.

This species has been taken at Sikkim by Col. Bingham.

BRACONIDÆ.

Iphiaulax bhotanensis, sp. nov.

Ferruginous; smooth and shining, sparsely covered with fuscous hair, which is longer on the metanotum and base of abdomen; the flagellum of antennæ black, fuscous at the base; wings yellowish hyaline, the stigma and nervures luteous; there is a broad blackish cloud, extending obliquely from the costa at the base of stigma to the recurrent nervure, it occupying the discoidal cellule, except a triangular space at base; there is a light fuscous cloud at the apex of both wings, that on the anterior reaching to the second transverse cubital nervure, and more broadly backwards behind. ♀. Length, 14 mm.; terebra, 10 mm.

Abdomen slightly longer than the head and thorax united, not dilated in the middle, as wide as the thorax. There is a distinct longitudinal keel in the centre of the first abdominal segment on the basal three-fourths, the keel stoutest in the middle; there is a similar keel, triangularly dilated at the base—the triangle longer than it is wide at the base—down the middle of second segment, extending close to the apex; the suturiform articulation is wide and crenulated; there is a wide, deep, curved depression down the sides of the second segment, and a narrower, oblique, clearly defined one on the basal lateral half of the third; there is a smooth, distinct, transverse furrow on the base of the fourth. Face distinctly but not closely punctured. Temples wide, obliquely narrowed, not or hardly rounded; the occiput not quite transverse. Ocellar region distinctly raised. Wings longer than the body; the recurrent nervure is received in the apex of the first cubital cellule, not interstitial; the transverse median nervure is not quite interstitial, being received shortly beyond the transverse basal.

ICHNEUMONIDÆ.

Hadrocryptus tuberculatus, sp. nov.

Black; the face, clypeus, except for a small irregular mark in the centre of the top above, extending on to the face, and a narrow line on its apex, dilated in the middle, and extending on to the margined sides, labrum, mandibles except the teeth, palpi, the inner orbits to the occiput, the outer more broadly from near the top, where it is narrowed, below extending on to the malar space; pronotum at the base, a line, narrowed behind, on the sides of the middle lobe of mesonotum at the base, a transverse mark near the apex of the middle lobe, scutellum, except for a mark on the base, post-scutellum, scutellar keels, a large mark on the apical slope of the metanotum, its apex obliquely dilated laterally, the sides of the dilated part oblique, straight; the top rounded; a large mark on the lower part of mesopleuræ, its basal half narrowed and turned upwards, a narrow line on the apex reaching to near the bottom from the top, a broad line on the upper three-fourths of the apex of the metapleuræ, bands on the apices of the abdominal segments, broad on the basal segments, becoming narrower on the apical, especially in the centre; that on the penultimate wider and more irregular, and the basal and apical ventral segments broadly, pale yellow. Four front legs yellow, the femora fulvous, the apical joints of the tarsi black; the hind coxae black, a large yellow mark on the top above, obliquely widened on the inner side, the basal joint of the trochanters yellow, streaked with black above, the apical black; the femora fulvous, the base very slightly, the apical sixth black; the tibiæ and tarsi yellow, the base of the former narrowly, its apex more broadly black, as is also the extreme apex of the last joint of the hind tarsi. The sixth to the eleventh joints of the antennæ are white, except above. Wings hyaline, the nervures and stigma black. ♀. Length, 15 mm.; terebra, 5 mm.

Face and clypeus distinctly punctured, the latter more closely and strongly than the former; its apex transverse, tuberculate in the middle, the sides distinctly curled up; the tubercle on the face large, longer than wide, narrowed below. Front and vertex smooth, the latter slightly punctured in the middle, the former much more distinctly and closely punctured in the middle, where there is an indistinct crenulated furrow. Mesonotum closely but not strongly punctured; the scutellum much more coarsely punctured, the post-scutellum smooth. Base of metanotum smooth, the part between the base and keel closely but not strongly punctured; the apical part closely reticulated; the basal keel complete; the apex with a broader keel on the sides. Propleuræ smooth, the middle and lower apical part closely striated; the mesopleuræ, except at the apex above, closely finely punctured; the depression at the base with some stout keels, as has also the bordering apical furrow. The metapleuræ at the spiracles finely punctured; the lower basal part coarsely punctured, the apical stoutly, obliquely striated, the striæ more or less intermixing. First abdominal segment smooth at the base, the dilated part closely but not strongly punctured; in its centre is a large ovate fovea; the second is closely, distinctly punctured, the third weakly punctured, the others smooth.

The systematic position of *Hadrocryptus* is not clear. It has the parapsidal furrows, the sternal furrow, and the spiracles on the first abdominal segment as in the Cryptinæ, and the oral region is as in that group; on the other hand, the fore legs are as in the Xoridini, the tibiæ being short, thick, and distinctly contracted or narrowed at the base. The claws are large and curved, the tibiæ spinose; the four hind tibiæ are curved at the base. The transverse median nervure in the hind wings is broken below the middle; in the fore wings it is received before the transverse basal. The temples are not very broad, and are roundly narrowed. Its resemblance to *Echthrus* (which has been placed by some authors in the Cryptinæ, by others in the Pimplinæ, in the tribe Xoridini, from the position of the abdominal spiracles) is close—perhaps on the whole closer than with the Cryptinæ. I leave it in that group from the position of the abdominal spiracles. To the generic description (Manchr. Memoirs, xlvi. (v.), No. 14. p. 11) should be added, "Apex of clypeus with a minute tooth in the middle."

Cratojoppa cingulata, sp. nov.

Black; the face, clypeus, labrum, mandibles, except at apex, a line round the orbit, that on the outer becoming gradually widened below, a line on the base, top and bottom of prothorax, two lines, straight on the inner, rounded on the outer side on mesonotum, the scutellar keels, a line round the sides and apex of scutellum, post-scutellum, a mark, dilated to a fine point on the outer side, on the sides of the metanotum, a line down the centre of the basal half of metanotum, roundly contracted at the base, united below to a large mark covering the outer apical area, the apex dilated on to the edge of the spiracular, along which the outer edge is continued, the top of the mark being roundly incised; tubercles, sternum, the mark extending on to the pleurae, the apices of all the abdominal segments, the lines on the second and third broader than the others, that on the fourth incised, and on the fifth interrupted in the middle—yellow. Four front legs yellow, the femora tinged with fulvous, the tibiæ and tarsi darker above; hind coxæ and trochanters yellow, the former largely and irregularly marked with black above, the femora reddish fulvous, their apical third black; tibiæ pale yellow, the apical third black; the tarsi white. Antennæ broadly ringed with white, the scape white below. Wings hyaline, the nervures and stigma black. ♂. Length, 15 mm.

Face and upper part of clypeus strongly but not closely punctured, the front and vertex very smooth and shining. Base and middle of mesonotum closely, strongly punctured; the sides sparsely punctured inwardly, outwardly smooth, as is also the whole of the apex. Scutellum strongly, deeply punctured, except along the edges; post-scutellum smooth. Areola smooth at the base, the rest finely, transversely striated, punctured along the sides. The lateral basal area with large, deep, clearly separated punctures in the centre; the apical lateral closely, deeply, strongly punctured; the apical slope strongly, transversely striated, the posterior median more closely, regularly, and

finely than the lateral. Pleuræ, except the middle of the pro- and the lower apical half of the mesopleuræ, strongly punctured, the metapleuræ more closely and strongly than the others. The first abdominal segment shining, smooth, except for a few scattered punctures on the post-petiole; the others closely punctured, strongly and closely on the second and third, weaker on the others. Disco-cubito nervure broken by a short stump; the transverse median received distinctly beyond the transverse median; areolet four-angled; the nervures meeting in front.

May be known from *C. maculata*, Cam., by the bands on the abdomen not being separated, but continuous. The differences between it and *C. robusta*, Cam. (which has the abdominal bands continuous) may be shown thus:—

- Four front legs rufous, the yellow mark on the lower orbits of equal width, the black apical band on the hind femora half the length of that on the tibiæ . *robusta*.
- Four front legs yellow, the yellow mark on the lower outer orbits much narrowed above, the black apical band on hind femora as long as that on the tibiæ . *cingulata*.

Acanthojoppa dudgeonii, sp. nov.

Ferruginous; the antennæ from the fifteenth joint, the depression at the base of metanotum, posterior median area, and the base of metapleuræ black; the basal part of antennæ, the face, orbits, and base of mandibles pale yellow; the wings yellowish hyaline, the apex from the radius fuscous violaceous, the costa and stigma testaceous, the nervures black. ♀. Length, 18 mm.

Head smooth, sparsely haired; the front in the middle above finely striated. Mesonotum alutaceous, finely, closely punctured at the apex. Scutellum closely, somewhat strongly punctured, and thickly covered with longish fuscous hair; the apex above broadly, roundly incised; the sides smooth, broadly rounded; the apical slope long, smooth, and bare at the apex. Post-scutellum bordered by a stout, rounded, curved keel; the base with some striæ. Areola large, six-angled, longer than its greatest width, its apex rounded inwardly, the base transverse; the lateral angle is in the middle; it is stoutly, irregularly, longitudinally reticulated; the basal lateral area stoutly, irregularly punctured, except round the edges; the second closely, stoutly, obliquely reticulated; the posterior median area closely, stoutly, transversely striated; the lateral stoutly reticulated; the spiracular area stoutly, obliquely striated, the striae more or less twisted. Propleuræ closely, finely punctured above, below striated, strongly above, finely below; in the centre, below the middle, is a stout keel; the basal upper half of mesopleuræ with large clearly separated punctures, the apical upper half smooth, the lower part closely, coarsely, rugosely punctured; the metapleuræ closely, strongly, rugosely reticulated. Abdomen smooth; the second and third segments closely punctured, the former more strongly than the latter; the sheaths of ovipositor largely projecting, as long as the apical two segments united. The long spur of the hind tibiæ reaches to the middle of metatarsus. The transverse cubital

nervures are almost united in front; the disco-cubital nervure is broken by a short stump; the transverse median received beyond the basal.

This species has the wings yellowish hyaline, with a broad fuscous violaceous cloud, as in *A. nigrolineata*, Cam., from Assam; that species may be known from it by the areola not being longer than wide, and by the thorax being largely marked with black.

Buodias rufo-ornatus, Cam.

The female of this species has been taken at Buxa, Bhotan. In coloration it hardly differs from the male, the only difference of note being that there is a small irregular yellow spot in the centre of the base of the second abdominal segment. The basal half of the hind femora is rufous. In length it is 17 mm., the ovipositor is 6 mm.

OPHIONINÆ.

Paniscus longitarsis, Cam. ?.

A single specimen may be this species. The tarsi unfortunately are broken. The colour is of a deeper, more uniform rufous than it is in normal examples: the ocelli are distorted. The nervures are uniformly black, darker coloured than in *longitarsis*.

FOSSORES.

Pompilus capitosus, Smith.

The abdomen in the only example is covered with a purplish pile. The clypeus is yellow, except for a black mark, longer than wide, in the middle, its apex not reaching to the end. The four posterior spurs are yellow, black at the base. The second abscissa of the radius is twice the length of the third, which is as long as the space bounded by the third transverse cubital and the second recurrent nervure.

NOTES AND OBSERVATIONS.

STENOPTILIA GRAPHODACTYLA, A NEW BRITISH PLUME.—While collecting in East Dorset during the past summer, I had the good fortune to discover the larvæ of this pretty little moth feeding in the flowers of the marsh-gentian (*Gentiana pneumonanthe*), and several of the perfect insects were bred. I also beat one or two of them from amongst mixed herbage, but they seem to be sluggish in their habits, and only fly for a short distance after being disturbed. It occurred in boggy places on heaths, and, unless the larva feed on other plants, I do not think it is likely ever to be very plentiful, as marsh-gentian is excessively local. This form of *graphodactyla* is near to var. *pneumonanthes*, Schleich.—GERVASE F. MATHEW; Dovercourt, Essex, Nov. 22nd, 1906.

MYELOIS CERATONÆ AND ITS VAR. PRYERELLA.—In an article by Mr. South (Entom. xxiii. p. 801) a reference occurs to the effect that

M. Ragonot held the opinion that *pryerella*, which at one time was considered a distinct species, was only a bleached form of *ceratoniae*, and in this Mr. South concurred. During the winter (1904-5) I found at various times odd larvae, to the total number of half a dozen, feeding in dates purchased in Liverpool. The fruits thus tenanted were put on one side, and towards the end of July, 1905, three moths emerged, while three of the larvae had died, probably through injury when the fruit was opened. Later in the year I submitted the imagines to Mr. Eustace Banks, who found them to be as follows: One *M. ceratoniae* (type), one var. *pryerella*, and one intermediate between the other two, but approaching *pryerella*. My object in writing the above is to call attention to the fact that *pryerella* is not a *bleached* form of *ceratoniae*, but a good variety. It does not appear to be necessary for the elucidation of this point to do more than mention that the forms are—(1) type, grey; (2) *pryerella*; white, with very slight sprinkling of fuscous about the subterminal line on fore wings; (3) *intermediate*, like 2, but with rather more fuscous scaling. The last two both have ochreous suffusion along the costa and nervures of all the wings. Last winter, although carefully looked for, no larvae were found. There is no external evidence of the presence of a larva in the fruit; it is only when opening a date to remove the stone that a tenant is detected. The larva lies along the stone, and makes no effort to escape; neither does it appear alarmed when suddenly exposed. I hope to be able to obtain more material for the study of this interesting species in the course of the present winter.—WM. MANSBRIDGE; Liverpool.

LARVA OF *LIMENITIS SIBYLLA*.—Mr. W. J. Lucas's interesting note in the 'Entomologist' for December, 1906, on the early stages of *Limenitis sibylla*, brought to my mind W. Müller's elaborate paper, "Südamerikanische Nymphalidenraupen" (Zool. Jahrb., Bd. i., 1886, pp. 417-678). The author remarks on the habit of many genera allied to *Limenitis* of feeding in the larval condition from the tip of a leaf towards the stalk, so as to leave the midrib intact. These genera he accordingly groups together as "Rippenbanenden" (see especially pp. 553-561). In Taf. 14, fig. 15, he illustrates, by a striking figure of the young larva of a species of *Anaea* on a partly-eaten leaf of its food-plant, the protective resemblance between the larva itself and the fragments of leaf still left adhering to the midrib. This seems quite comparable with the means of protection employed by the young larva of *L. sibylla* to which attention is drawn by Mr. Lucas.—F. A. DIXEY.

THE MATHEW COLLECTION OF BRITISH LEPIDOPTERA.—On November 20th, 1906, the fine collection of British Lepidoptera formed by Paymaster-in-Chief G. F. Mathew, was dispersed at Stevens's. Altogether there were 524 lots, realizing a grand total of about £325. The prices obtained were fairly good on the whole, but there were some curious fluctuations in the bidding, and some of the purchasers must have congratulated themselves on the bargains they secured. Five specimens of *Chrysophanus dispar*, three males and two females, realized just under £10, although one of the females fetched 80/- and the other 40/-. Two examples of *Deilephila euphorbiae* from Raddon's collection went for 8/-, and eight specimens of *D. galii* for about 5/- each. An example of *D. livornica*, taken in May, 1906, made a guinea, and one

of *Cerura celerii* 28/-. Of hybrid *ocellatus-populi* there were two examples, and each of these, together with four *S. ocellatus*, went for 20/-. Two yellow varieties of *Zygæna filipendula* sold for 20/-. *Arctia villica* is, as a rule, a fairly constant species, and such a range of aberration as that shown in Mr. Mathew's series is probably rarely seen in collections. The specimens numbered eighty-five in all, many were exceedingly nice varieties, and some were remarkable examples. Two, offered singly, realized 42/- and 65/- each; whilst several pairs were disposed of at from 85/- to 85/- per pair. Two lots, each comprising four of the old Cambridge specimens of *Lymantria dispar* and a few aberrations of *L. monacha*, made 11/- and 15/- respectively. Three fine dark forms of *L. monacha* sold for 28/-, but three others, perhaps rather darker, went for rather less than half that sum. A lot of twenty-six *Metacraena castrensis*, including a nearly white female, brought in £3. British specimens of *Drepana sicula*, of which there were four specimens, seemed to be considered worth 10/- or 11/- apiece; but for the other species of *Drepana* the bidding was not keen. Three bred specimens of *Cerura bicuspis* from Tilgate Forest made 82/6, and two fine dark forms of *Stauropus fagi* 11/-. Hybrids from a cross-pairing of *Notodontia riczac* ♂ and *N. dromedarius* ♀ sold for 9/-, 10/-, and 12/- each. Two lots of *Leucania*, in which the plums were six, and five bred specimens of *L. vitellina*, made 85/- and 55/- per lot; four typical *L. albipuncta*, with twenty-three examples of other species, sold for 10/-; but two lots, including four *L. albipuncta* var. *lutea* in the one, and four var. *grisea* in the other, yielded 20/- and 80/-. A variety of *L. straminea*, with six other specimens of the same species and eight *L. impura*, fetched 12/-, but for a similar lot, including two varieties of *L. straminea*, the price ran up to two guineas. Of *L. fasciolaria* no less than sixty-three specimens were offered, chiefly in lots of four examples. The types from which Barrett described the species sold for 24/-, and the cotype of ab. *anea*, Mathew, for 95/-; three specimens of ab. *lutea-typica*, Tutt, made 57/6, and other named forms sold in lots of four specimens at from 22/- to 50/- per lot. *Senta maccormicki*, with various named aberrations, and examples of other species, went at 21/- a lot. One series of five *Tapinostola concolor* brought in £1/-, and another lot of five 80/-. Batches of six Irish and Spanish *Conistra erythrocephala*, with some *N. typhæa*, found buyers at 22/- and 24/-. Some curious forms of the *Hydræcia* named *paludis* went in lots of three dozen or more, at prices varying from 21/- up to 87/6. There were several specimens of *Hama (Mamestra) abjecta* v. *variegata*, which closely resembled the variegated form of "Apamea" *geminata*, but we only caught the price obtained in the case of one lot, in which there were four examples of the variety; this was 40/-. Eight fine specimens of *Leucania hyperborea* (*alpina*) reached 29/-, and three others, with a very variable series of *Tanacocampa incerta*, went for 11/-. One hundred of *Leucania myrsinophala* from Lewes (ex. coll. S. Stevens) sold at 18/-. For *Leucania luteago* var. *barrettii* the price was about 4/-. With eight specimens of *Polia nigrocincta* (five very fine, with yellow stripes), went for 18/-, another lot of seven very fine specimens at 21/-. A lot of *Aplectas*, in which two examples of *Leucania leucania* were included, were sold for 87/6. The sum of 11/- was given for a specimen of *Crymodes exquisitus* from Rannoch.

Bred specimens of *Xylomiges conspicillaris* from Taunton made about 5/- each, and others, also bred, but locality not indicated, fetched 1/- more per specimen. Eleven shillings was given for one example of *Xylina conformis* from Bathampton. There were six specimens of *Cucullia gnaphalii*, and these made 53/-. Two lots of *Plusias*, each comprising eight specimens of *P. bractea*, with seven *P. chryson*, and eight *P. festucæ*, were sold for 40/- and 32/6 per lot. Of *Catocala fraxini* there was a specimen from Glynde, Sussex, and for this the bidding went up to 47/6. The first known British specimen of *Nyssia lapponia* was taken about thirty-five years ago, and up to 1895 it remained unique. The ten specimens of this species in Mr. Mathew's collection, offered with other things in two lots, brought in 58/-; so that 6/- would seem to be the present auction price, whereas the original specimen was once sold in the same rooms for the tall price of £14. The aberrations of *Abraxas grossulariata* were numerous. Six of the best of these brought in a total of £10 12s. 6d., which included 65/- for one female ab. *lutea*, 45/- for a male of the same form, and 35/- for a specimen of *fulvapicata*.

CAPTURES AND FIELD REPORTS.

SESSA CULICIFORMIS AND HELIOTHIS PELTIGERA IN DORSET.—On June 4th, 1906, I captured in Berewood, Dorset, nine specimens of *Sesia culiciformis*, and two examples of *Heliothis peltigera*, and on June 10th one further *S. culiciformis*. The Sesiids came to the blossoms of the rhododendron, and visited exclusively the common purple one, although there were many plants in full bloom of the beautiful nursery variations. They flew almost exclusively during the very hottest sunshine, when even the active *Argynnis euphrosyne* seemed overcome by the heat. They were very wary, and I missed the first four that I saw. However, after I had got used to the tactics of the insects I caught nine out of ten, making a total of fourteen seen. It was quite impossible, once they had jumped, to follow them amongst the maze of flies, bees, and wasps dancing around the bushes. The one captured on the 10th was worn and was, moreover, the only one seen, so presumably the brood was over. Of the *Heliothis peltigera*, one was flying at purple bugle, and the other was imprisoned in a rhododendron flower. The adhesiveness of the pistils, stamens, and stems of the rhododendron flower is wonderful, nearly every *Sesia culiciformis* was a leg or more short, and *H. peltigera* lacked the apex of the right fore wing, which, when I endeavoured to dislodge the insect, remained sticking to the pistil. I found remains of several insects, including *culiciformis*, in the flowers. They had evidently met their death in the same way as a house-fly on a "fly cemetery" I saw a queen wasp get stuck, and after repeatedly stinging the pistil she bit it through at the base and fell out of the flower to the ground, still endeavouring to disengage herself from the pistil. Owing to the thickness of the bushes I was unable to see whether the efforts were successful. The interest of the capture of *Sesia culiciformis* lies in the fact that I only know of two records for Dorset; one by J. C. Dale in

1865, and one by the Rev. F. H. Fisher *circa* 1894.—W. PARKINSON CURTIS, Poole.

CHÆROCAMPA CELERIO IN SELKIRKSHIRE.—On October 13th a specimen of this fine moth was found by a little girl in Galashiels, and brought to her teacher, who sent it to Mr. William Shaw in the same town—an enthusiastic botanist and entomologist—for identification. Mr. Shaw says the insect is in very fair condition, being only a little rubbed on the tip of one wing. He has not heard of it in this country side since 1873, when his brother took one in Berwickshire.—B. WEDDELL.

DEIOPÉIA PULCHELLA IN IRELAND.—A young cousin of mine caught a specimen of *D. pulchella* on the Ballivane Road, Cork, on October 24th, between 11 o'clock and noon. He sent it to me in a match-box, alive, and it arrived in good condition. I believe this to be a rare and valuable moth, and should be much obliged if you can give me any information concerning it, as I have not seen one before, and have not heard of a British specimen being captured for a good many years.—

ROSE M. DAKIN; Grapenhall, Cheshire, November 22nd, 1906.

D. pulchella [In the 'Entomologist,' vol. xxv. pp. 152-155, the records of *D. pulchella* in Britain are discussed, and a table given, showing the years, up to 1892, in which the species occurred in, or was apparently absent from, our islands. Since 1892, when about twenty specimens were captured, only odd examples have been observed. Of these one was taken in July, 1894, one in August of the same year, and one in 1895. One or two were reported to have been found under exceptional circumstances in 1901. The records for 1906, so far, are only three: one from Sussex, one from West Cornwall, and one from Cork, Ireland. Probably there had been a migratory movement of the species last autumn in the direction of the British Isles, but if so, it would seem that only a very few individuals effected a landing here.—Ed.]

OCCURRENCE OF XANTHIA OCCELLARIS, Bkh., IN NORFOLK.—Mr. R. S. Smith, Junr., of Downham Market, has recently submitted a Noctuid to me for identification. I saw at a glance that it might be *X. ocellaris*, and a reference to Barrett's 'Lepidoptera' convinced me that I was right. This specimen was a male, and in very fine condition. Mr. Smith tells me that he captured it in West Norfolk, the first week in September of this year. He also states that he has another specimen, not in such fine condition, which was taken by himself in the same district two years ago. I am aware that this rare species has been taken in Suffolk, but I believe this is the first record of its occurrence in Norfolk; it will therefore be a very welcome addition to our county list.—E. A. ATMORE; King's Lynn, Norfolk, November, 1906.

LAPHYGMÀ EXIGUA IN DEVONSHIRE.—Six specimens of *Laphygma exigua* (identified by Mr. Rowley, Curator of the Exeter Museum) were taken here, at light, in August last. Four of the examples are in bred condition.—J. POPE; 11, Portland Street, Newtown, Exeter.

HELIOTHIS ARMIGERA IN CORNWALL: A CORRECTION.—I regret to find that in error I recorded *Heliothis armigera* as observed by me in North Cornwall and Corsica, during the past summer (see 'Entomologist,' xxix. p. 290). I find, on comparing the specimens, which are very

worn, with those in my cabinet, that they are undoubtedly *H. peltigera*.
W. S. SHELDON; Youlgreave, South Croydon.

LEUCANIA UNIPUNCTA IN HAMPSHIRE.—On September 12th last I took a specimen of *L. unipuncta*, Hw. (*extranea*, Gn.) in good condition, at sugar, near the village of Burley, in the New Forest.—A. R. KIDNER; 139, Rosendale Road, West Dulwich, S.E., December 17th, 1906.

TÆNIOCAMPA STABILIS IN NOVEMBER.—While working ivy on November 21st last, I took a male specimen of the above-named moth.—G. B. CONEY; The Hall, Batcombe, Somerset.

OCCURRENCE OF SPILOSOMA MENDICA IN NOVEMBER.—I took a good specimen of *S. mendica* on November 6th last.—H. J. BAKER; Winterbourne, Wain-a-long Road, Salisbury.

RETARDED EMERGENCE OF DEMAS CORYLI.—On November 17th last a fine male *D. coryli* emerged from the pupa: is not this a very unusual occurrence? I may mention this was not an isolated pupa, but was one of a large brood from which the bulk of the imagines emerged during the first week in July.—J. B. MORRIS; 14, Ranelagh Avenue, Barnes, November 25th, 1906.

DASYCHIRIA PUDIBUNDA EMERGING IN AUTUMN.—Out of a large batch of ova laid on June 2nd last, by a female of *D. pudibunda*, L., taken in the New Forest, I had about twenty. Twelve of the larvæ were allowed to feed up, and pupated between August 8th and 26th. The pupæ were placed in an unwarmed conservatory. A female moth emerged on September 9th; five males and three females between October 1st and 12th; a male on November 3rd; and another on the 27th. The last pupa is still alive. Pupæ of several other species are being kept in the same boxes; but none have shown any signs of departing from their normal season of emergence. Several moths, however, have been reared by friends from other ova laid by the same female, which were not treated exceptionally in any way.—A. R. KIDNER; 139, Rosendale Road, West Dulwich.

PLUSIA MONETA IN CHESHIRE.—In the record, Entom. xxxix. p. 291, after "captured in his house," add "at Sale, Cheshire."

MIGRANTS.—The year 1906 will be famous for the clouds of ants which suddenly appeared in this corner of Kent. Apparently they stretched or travelled from Deal to Margate, about a dozen miles as the crow flies. Hitherto I was rather incredulous about such visitations, and it is still a mystery to me how these little flies—as ordinary people call them, and which were found to be winged ants—can be carried miles away from their breeding-place and dumped down indiscriminately. Amongst migratory Lepidoptera this season has produced little that is noteworthy. *Pyrameis cardui* has been in evidence sparingly, both worn specimens in early summer, and brightly coloured ones in September; but apparently the Eastbourne, &c., migration did not reach us. *Vanessa io* was very scarce; one specimen occurred indoors, in Margate, the first seen for several years; *V. polychloros*, also indoors; this is the first example I have seen in Margate in twenty-five years. *Colias hyale*, one specimen seen and missed, but afterwards

captured by some boys; *C. edusa*, twenty to thirty seen, and some captured. *Sphecia eretzi*, no longer a migrant, but is probably affected by climatic conditions. I captured a battered female miles away from the headquarters, but failed to find another specimen. I consider the species naturalized. *Acherontia atropos*, no record this season. Last year one collector bought and sold over a thousand pupae dug up in Thessaly; after their journey by rail the emergences were nil. *Macroglossus stellarum*: I place this species amongst those which come to us from the Continent. This autumn it has turned up frequently here, and I have some still alive. *Nonagria sparganii*: this species has either invaded my locality, or I have discovered its habitat. J. P. BARRETT: St. John's Villas, Margate.

SUGARING AND ATMOSPHERIC CONDITIONS.—My experience of sugaring early in September, 1906, leads me to think that atmospheric conditions, even when the weather appears normal, greatly affect the number of moths that come to sugar. I sugared some posts here, as when the weather would permit sufficient darkness, and the catch was very insignificant. I set five specimens out of possibly a hundred which put in an appearance. As the posts numbered exactly eighty, the average was a little over one moth per post. A few days later I sugared again, the same mixture, the same quantity; but the posts remaining dark darkness I found I had some sugar left, and so increased the number of posts to exactly one hundred. In my entomological career I have had good nights. Once I calculated there were 1000 moths on the sugar, but that night in early September of 1906 easily beat my old record. The moths—about nine-tenths being *Xylophasia polyodon*—were very quiet on the sugar, in some instances very slowly packed, and fortunately the "skittish" *Xylophasia polyodon* was nearly gone. Occasionally a moth in the centre would startle the rest, and they all off in a patch, but quickly returned. I made a careful examination, although it took me all my time to look for "plums" sufficient to match "dough," and I reckon at least five thousand moths had a supper at my expense—at least fifty per post. I selected four posts out of the lot, and these included two very fine *Laphygma*, one *Chionodes endoxylaris*, and the rest were mainly *N. xanthoptera*. Perhaps twenty-five species contributed to the total. Later on I sugared again, and on no evening did the total exceed an estimate of two hundred and fifty, sometimes falling below one hundred.—J. P. BARRETT: St. John's Villas, Margate.

CHARTER HIGHLIGHTS FOR 1906:—HERTFORDSHIRE—Shenley: *Sympetrum vicinum*, plentiful in August and September. *Anax imperator*, *lunulata*, August 8th. *Aeschna cyanea*, abundant in September. *A. p. elegans*, abundant. *Ischnura elegans*, abundant; last observed on August 20th. *Agrion puella*, abundant. *Enallagma cyathigerum*, *hymenopterum*.

BURNHAM MANOR—Eton: *Aeschna cyanea*, abundant in September and October. *Ischnura elegans*, very abundant; first observed on June 2nd. *I. splendens*, very abundant; first observed on June 3rd. *Lynxia phaeoleuca*, very abundant; first observed on May 24th; last observed on July 22nd. *A. puella*, not very plentiful. Burnham Hill-pool: *Ischnura elegans*, very abundant. *Agrion puella*, male,

June 12th. *Enallagma cyathigerum*, males abundant, females not observed.

BERKSHIRE—Swinley Forest; Ascot: June 23rd, *Libellula depressa*, male (not captured). *L. quadrimaculata*, male (not captured). *Anax imperator*, male (not captured). *Agrion puella*, plentiful.

SOMERSETSHIRE—Shirehampton (near Bristol), September 15th, *Æschna cyanea*, female. September 17th, *Sympetrum sanguineum*, males (not captured); *Æ. cyanea*, female; *Æ. grandis*, female (not captured).—E. R. SPEYER; November 27th, 1906.

NOTES ON LEPIDOPTERA REARED DURING 1906.—From ova deposited by a female *Angerona prunaria*, taken at Bricket Wood, near Watford, on June 27th, 1905, I have this year reared a number of specimens. The moth laid over three hundred eggs, and the young larvæ were sleeved on plum. In the autumn I divided the brood, giving part to my friend Mr. A. E. Gibbs, of St. Albans. The larvæ which I retained were kept in bags in a shed during the winter, and in the spring part of them were sleeved out again, and the others placed in breeding-cages, and supplied with plum, birch, and lilac. The first began to spin up on May 20th, but some of those in the sleeves out of doors did not do so until about June 15th. The dates of emergence of the perfect insects were as follow:—June 17th, two males; 18th, one male, one female; 19th, three males; 20th, ten males, seven females; 21st, sixteen males, thirteen females; 22nd, four males, seven females; 23rd, seven males, five females; 24th, three males, four females; 25th, one male, six females; 26th, one male, one female; 27th, two males, one female; 28th, two females. July 2nd, two females; 4th, one female. Of these, twenty-six males and twenty-six females were of the type form, and twenty-one males and twenty-five females of the banded form (var. *corylaria*). In addition to these, one male was a cripple, and nine more (males) failed to make good their escape from the leaves enclosing the cocoons. This was owing, I think, to the leaves (plum in most cases) becoming so shrivelled and hard that the moth was unable to force a way out. In future I shall remove the pupæ from the cocoons, and put them in moss. Mr. Gibbs bred sixty-four moths, nineteen males and eighteen females of the type form, and fourteen males and thirteen females of the var. *corylaria*. The total number of imagines obtained from the one brood was one hundred and seventy-two. The moths I bred show a certain amount of variation. One male of the type form has the ground colour of rather deeper orange than usual, and the dark strigulation strongly developed. Two males of the var. *corylaria* form have the band on the hind wings of a greyish colour, and some have the orange spot at the apex of the fore wings almost wanting, while in others it is so much enlarged that it joins the median band. The females of the var. *corylaria* form vary somewhat in the depth of the colour of the dark border, and also in the size of the yellow spot at the apex of the primaries, but the latter does not join the median band in any of the specimens.

In May, Mr. Gibbs gave me some ova of *Nyssa lapponaria*, laid on April 21st and 22nd by a female from the Rannoch district. They began to hatch on May 20th, and were all out by the 23rd. The eggs are bright green when laid, and turn a beautiful steel-blue colour



... in spite of every care
I saved some on apple,
I have but fifteen pupæ

... the morning at Box-
... been discovered from
... had been forestalled by
... and thick stick. On
... continuous work, we found
... of other species. *Lithosia*
... we did not take many,
... when the larvæ are taken
... bushes, and secured a lot
... spun up in moss, and the

... viamines from the egg, and
... This I placed in a cage
... sun. The butterfly did not
... a few eggs were deposited.
... others shortly after. They
... malism or some other cause,
... 24th.

... found about forty *Teniacampa*
... were then half an inch long,
... wing to pupate on June 19th.
... about twenty larvæ of *Sylepta*
... These all pupated in a few days.
... long, slender, very shiny black,
... emerge July 3rd.

... *abietaria* larvæ mentioned
... the middle of July—two males
... dark form.

... were reared from the egg to the
... experienced with *Melanippe hastata*,
... and others.—PHILIP J. BARRAUD;

SIXTY FIES.

... London.—Wednesday, November 7th,
... president, in the chair.—Mr. Gerard H.

... Mr. Harold Armstrong Fry, P.O.
... was. Colony; Mr. Frederick Albert

... Park Gardens, London, W.; Mr.
... Cambridge; Mr. Percy A. H.

... Geneva; and Mr. Oswin S.
... Cambridge Place, Colombo, Ceylon, were

... Mr. H. J. Lucas exhibited a photograph
... nearly immaculate, taken at Tongue,
... special form for comparison, corresponding
... Mr. Stephens. He also showed a series of

other members of the genus to illustrate the range of spotting on the wings of both sexes.—Mr. G. C. Champion showed a long series of a *Henicopus* (probably *H. spiniger*, Duval), from El Barco, Galicia, Spain, to demonstrate the dimorphism of the females.—Mr. H. St. J. Donisthorpe exhibited seven specimens of *Prionocyphon serricornis*, Müll., bred from larvae taken in the New Forest in July, living larvae, and a larva and pupa figured, of the same, and read a note on the species.—Dr. T. A. Chapman brought for exhibition a collection of butterflies, made in Galicia (lat. $42^{\circ} 16' N.$, long. $6^{\circ} 44' W.$) last July, including (a) specimens of *Lycæna idas*, hitherto reported only from the Sierra Nevada, and therefore a surprise in the extreme north-west. It occurred at an elevation of 4500 to 5000 feet, and only where there grew a species of *Erodium*, with extremely large handsome flowers; (b) specimens of *L. argus (ægon)* from the same district, which though close to the vars. *hypochiona* and *bejarensis*, differed in a certain proportion of the specimens presenting the red of the marginal "peacock eyes" on the upper surface of the hind wings of the males.—The Hon. N. C. Rothschild exhibited branches of *Viburnum lantana* showing the mines of *Sesia (Egeria) andreniformis*, now discovered by him as the food-plant of the species in Britain for the first time.—Mr. E. Dukinfield Jones exhibited two species of the genus *Molipa*, bred from Brazilian larvae which were identical in form. He also showed photographs of the larvae *in situ*.—Mr. F. A. Dixey exhibited specimens of Pierine butterflies, selected to illustrate the various conditions under which pigment might be replaced by black. He said that in his opinion melanism, though it might arise as a sport or as a variation, owed its establishment and increase to the principle of selective adaptation.—The President mentioned a bug, which Mr. Cecil Floersheim had found very destructive to the eggs of *Papilio machaon* and *P. asterias*, as a remarkable instance of a species of carnivorous *Heterotoma*.

Wednesday, November 21st.—Mr. F. Merrifield, President, in the chair.—The Secretary read the list of fellows nominated to serve as officers and other members of the Council for the session of 1907–8.—Mr. Walter E. Collinge, M.Sc., of 55, Newhall Street, Birmingham, and Mr. H. S. A. Guinness, of Balliol College, Oxford, were elected Fellows of the Society.—Mr. H. W. Andrews exhibited specimens of *Odontomyia angulata*, Pz., from the Norfolk Broads, a species few captures of which have been recorded of recent years, and *Icteria westermanni*, Mg., a rare Trypetid, taken by him in the New Forest.—Dr. F. A. Dixey showed specimens of South African Pierinæ demonstrating that the wet-season form of *Teracolus regina*, Trim., was in mimetic association with an undescribed species of *Belenois*, intermediate between *B. calypso* and *B. thysa*.—Mr. W. J. Lucas exhibited, on behalf of Messrs. H. and F. Campion, a male specimen of *Sympetrum vulgatum* taken in Epping Forest on the 4th September last, of which species only three other authentic British specimens are known.—Mr. R. Adkin exhibited a short series of *Tortrix pronubana*, Hb., including both sexes, which he had reared from larvae and pupæ collected from *Euonymus* at Eastbourne in September last. The only previous records for the species in Britain are single male examples captured at Eastbourne and at Bognor respectively in the autumn

before hatching. I started them on birch, but in spite of every care they rapidly dwindled in numbers. Later I sleeved some on apple, but only a few fed up properly. In the end I have but fifteen pupæ from over two hundred eggs.

On May 6th I joined Mr. A. L. Rayward in the morning at Boxhill to beat for *Boarmia abietaria* larvæ, but we soon discovered from the battered appearance of the trees that we had been forestalled by someone evidently possessed of a strong arm and thick stick. On comparing notes at the end of four hours' continuous work, we found we had just a dozen larvæ apiece, and a few of other species. *Lithosia deplana* larvæ were beaten in some number, but we did not take many, as it is almost impossible to breed the moths when the larvæ are taken young. We subsequently beat a few juniper-bushes, and secured a lot of *Eupithecia sobrinata* larvæ. These soon spun up in moss, and the moths emerged from July 27th onwards.

I was rather anxious to rear *Euchloë cardamines* from the egg, and caught a female at St. Albans on May 18th. This I placed in a cage with some hedge-mustard, and kept in the sun. The butterfly did not begin to lay till the 19th, and then only a few eggs were deposited. The first hatched on the 24th, and the others shortly after. They began feeding well, but, owing to cannibalism or some other cause, only one reached the pupa state on June 24th.

On June 3rd, in the Wye Valley, I found about forty *Tæniocampa miniosa* larvæ on a twig of oak. They were then half an inch long, and fed up very rapidly on oak, commencing to pupate on June 19th. On June 4th, in the same locality, I took about twenty larvæ of *Sylepta (Botys) ruralis* from a bed of nettles. These all pupated in a few days. The pupa is five-eighths of an inch long, slender, very shiny black, abdomen pointed. The moths began to emerge July 3rd.

The moths resulting from the *Boarmia abietaria* larvæ mentioned above emerged between June 24th and the middle of July—two males and six females, nearly all of a very dark form.

Several of the *Tæniocampidæ* were reared from the egg to the pupa state, but failures were experienced with *Melanippe hastata*, *Ephyra punctaria*, *Epione advenaria*, and others.—PHILIP J. BARRAUD; Bushey Heath, Herts.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, November 7th, 1906.—Mr. F. Merrifield, President, in the chair.—Mr. Gerard H. Gurney, Keswick Hall, Norwich; Mr. Harold Armstrong Fry, P.O. Box 46, Johannesburg, Transvaal Colony; Mr. Frederick Albert Mitchell-Hedges, 42, Kensington Park Gardens, London, W.; Mr. Gordon Merriman, Trinity Hall, Cambridge; Mr. Percy A. H. Muschamp, 20, Chemin des Asters, Geneva; and Mr. Oswin S. Wickar, Crescent Cottage, Cambridge Place, Colombo, Ceylon, were elected fellows of the Society.—Mr. H. J. Lucas exhibited a photograph of *Panorpa germanica*, practically immaculate, taken at Tongue, Sutherlandshire, and a typical form for comparison, corresponding apparently to the *borealis* of Stephens. He also showed a series of

of 1905.—Dr. T. A. Chapman exhibited a long series of *Cænonymphia mathewi*, Tutt, from different places in the north-west region of Spain (Galicia), and gave it as his opinion that it must be regarded as a geographical or subspecific variety of *C. dorus*, and not a fully established species.—Professor E. B. Poulton, F.R.S., communicated “A Permanent Record of British Moths in their Natural Attitudes of Rest,” and “Further Notes on the Choice of a Resting-site by *Pieris rapæ*,” by Mr. A. H. Hamm; Mr. R. Shelford, M.A., F.L.S., “Studies of the Blattidæ”; the Hon. N. Charles Rothschild, “Notes on the Life History of *Sesia andreniformis*, Lasp.,” and Mr. Hubert W. Simmonds, “Notes on an Unusual Emergence of *Chrysophanus salustius* in New Zealand.”

Wednesday, December 5th.—Mr. F. Merrifield, President, in the chair.—The Hon. Secretary announced that the Halliday correspondence had been presented to the Society by Dr. E. Percival Wright, of Trinity College, Dublin.—Mr. H. C. Pratt, Government Entomologist, Federated Malay States, Kuala Lumpur; Capt. H. J. Walton, M.B., F.R.C.S., Indian Medical Service; Mr. Arthur Ernest Gibbs, F.L.S., Kitchener's Meads, St. Albans; Capt. James Bruce Gregorie-Tulloch, King's Own Yorkshire Light Infantry; Mr. John Ashburner Nix, Tilgate, Sussex; Mr. Herbert W. Southcombe, J.P., 16, Stanford Avenue, Brighton, and Mr. Roland E. Turner, 21, Emperors Gate, N.W., were elected Fellows of the Society.—Mr. A. W. Bacot exhibited a specimen of *Catocala nupta*, taken at rest at Hackney, November 9th, 1906, remarkable for having two well developed tarsi on the left fore-leg. Also three female specimens of *Lasiocampa quercus*, L., bred from larvæ from Cornwall in 1906. One of these larvæ had been submitted to a pressure of from seventeen to thirty atmospheres (405 to 450 lb. per square inch) on two occasions; a pressure which had proved fatal at once to a frog, used as a control experiment. A discussion followed in which Dr. F. A. Dixey, Dr. Greenwood, and other Fellows joined.—Dr. T. A. Chapman—who exhibited a long series of *Hastula hyerana*, Mill., bred this year from larvæ collected at Hyères, and a diagrammatic map of the neighbourhood, to explain the distribution of the species in that area—pointed out that there were two colonies of *H. hyerana*, in one of which the melanic specimens were three times as numerous as in the other.—Dr. F. A. Dixey exhibited specimens of *Teracolus omphale*, Godt., bred by Mr. G. A. K. Marshall. The exhibit showed that under arranged conditions of moisture and warmth the wet-season phase might be artificially induced.—Mr. L. B. Prout read a paper entitled “*Xanthorhoe ferrugata*, Clerck, and the Mendelian Hypothesis.”—Dr. F. A. Dixey communicated a paper “On the Diaposematic Resemblance between *Huphina corva*, Wallace, and *Ixias baliensis*, Fruhst.”—H. ROWLAND-BROWN, M.A., Hon. Secretary.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—November 8th, 1906.—Mr. R. Adkin, F.E.S., President, in the chair.—Messrs. Harrison and Main exhibited bred variable series of (1) *Tethea subtusa*, from Fermanagh, and (2) *Numeria pulveraria*, from various localities, and pointed out the characteristic forms prevailing in each.—Mr. Newman, (1) *Anthrocera (Zygæna) purpuralis (minos)*,

from North Wales; (2) a dwarf example of *A. exulans*; (3) a pale *A. filipendulæ*; and (4) a very variable series of *Chrysophanus (Rumicia) phlaeas*, the pick of some three thousand third brood specimens passed through the net at Bexley.—Mr. Moore, a specimen of *Vanessa (Aglais) urticæ* very nearly approaching var. *polaris*.—Mr. Goulton, a specimen of the rare *Heliothis armigera* taken at light at Sutton, and a series of *Sesia (Ægeria) myopæformis* from the same locality.—Mr. Edwards, some large species of Coleoptera from Sierra Leone.—Mr. Rayward, ova of *Thecla (Strymon) w-album* found *in situ* on bark and twigs of wych elm.—Mr. R. Adkin, a series of *Scoparia dubitalis*, from Eastbourne, including some exceedingly pale forms, together with a similar pale example from the Barrett collection, and read notes on this local race.

November 22nd, 1906.—The President in the chair.—A Special Exhibition of Varieties.—Mr. South exhibited the large Chinese var. *chinensis* of *Vanessa urticæ* to compare with the very small *V. urticæ* ab. *urticoides* bred from larvæ fed on hop.—Mr. Lucas, for Messrs. F. W. and H. Campion, (1) a male of the very rare dragonfly *Sympetrum vulgatum*; (2) a series of *S. flaveolum*, including a female; and (3) a series of *Cordulia ænea*—all were taken in Epping Forest.—Messrs. Harrison and Main, (1) a brood of *Pieris brassicae*, including examples of the female, in which the two discal spots on both upper and under sides were more or less united into a band; (2) series of *Aplecta nebulosa*, from Delamere, Epping, and New Forests for comparison; (3) bred series of *Tephrosia biundularia* from the New Forest and from Delamere—the former light, the latter dark and intermediate; (4) bred examples of *Dianthæcia cæsia* from the Isle of Man; (5) *Acronycta alni* from the New Forest.—Mr. Kaye, a captured specimen of *Apatura iris* from the New Forest, measuring $3\frac{1}{16}$ in. in expanse, much larger than any bred specimen.—Mr. Dobson, four species of the genus *Sympetrum* taken in one place in Surrey on September 3rd—*S. striolatum*, *S. flaveolum*, *S. sanguineum*, and *S. scoticum*; he also showed series of sixteen species of bees of the genus *Bombus*.—Mr. G. B. Brown, his captures during a ten days' holiday at Deal in late July, including *Lithosia lutarella (pygmæola)*, *Calamia phragmitidis*, *Agrotis tritici*, *Eremobia ochroleuca*, *Dianthæcia cucubali*, &c.—Mr. P. J. Barraud, a series of dark and intermediate forms of *Xylophasia monoglypha* from St. Bees, Cumberland.—Mr. South, a short series of unusually large examples of *Dichrorampha flavidorsana* from his garden, and read notes on its distinctness and occurrence.—Mr. Tonge, the Lepidoptera taken by him on the Suffolk coast in July, including *Trochilium apiformis*, *Mamestra abjecta*, *Leucania straminea*, *Senta maritima*, *Acidalia emutaria*, &c., together with a series of admirable photographs of the natural resting positions of numerous species of butterflies and moths.—Mr. Goulton, varied series of *Oporabia dilutata*, *Melanthis ocellata*, and *Ypsipetes sordidata (elutata)*, from Ranmore Common, the last comprising black, banded, green, wainscot, and other forms.—Mr. Lucas, *S. vulgatum*, males, from Richmond Park and from Denmark, and also drawings of the male genitalia of *S. striolatum* and *S. vulgatum*, as well as photo-micrographs of the former male.—Mr. Chittenden, melanic *Larentia multistrigaria*, from York, dark *Hadena adusta*, from Rannoch, dark *Ypsipetes impluviata*, from Arran, &c.—Mr. Clark, the ichneumon,

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seen on November 21st.—Mr. R. Adkin, a series of *Leucania* reared from larvae collected at Eastbourne from October last, only two specimens having been obtained in the country; he also showed an asymmetrical specimen with the transverse lines of the left fore wing in a regular patch.—Mr. Sich, two imagines, with cases, were *Leucophora milvipennis*; and also German examples of *Catephia alchymista*, &c.—Dr. Chapman, a new species of *Cœnonymphia* from Galicia, Spain, which is closely allied to *C. dorus*; (2) a series of *Lycæna idas*; (3) a specimen with red on the hind margin of the hind wings; (4) *L. virgaureæ*—all three species from Galicia; and (5) some examples of *Hastula hyerana* and its forms from Spain, showing the black and white blotched varieties of *Arctia villica* and *Agriades*, showing the characters of both *E. minutata* and *E. leucanoides*. (1) *Lycæna (Agriades) corydon* with light markings; (2) *L. (Polyommatus) icarus* with large blotches on the orange on the under side of the hind wings; (3) *L. (Polyommatus) alcestis* with the markings along the outer margins of the wings changed.—Mr. Garland, for Mr. Pickett, (1) a specimen of *Lycaena prunaria*; (2) a specimen of *Ematurga atomaria* with orange markings; (3) a long series of *Hemerophila abruptaria* with various markings; (4) fine aberrations of *Lycæna (Agriades) corydon* for the year; (5) a light specimen of *Melitæa cinxia*; (6) *M. cinxia*.—Mr. West, Greenwich, cabinet collector of British Chrysomelidæ, Endonychidæ, &c. Mr. Gadge, a wire arrangement to affix to the microscope, which could be folded up when not in use; of Ashstead, exhibited under the microscope a series of *Pseudopontia paradoxa*, received from Mr. G. E. Moore, Hon. Report. Sec.

THE ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—
Dr. F. A. Chapman exhibited a series of *Pterophorus pentadactyla* from ova laid by imagines bred from larvae collected in May, 1905.—Mr. J. A. Clark, melanic form from Dalmard Bridge.—Mr. T. H. L. Grosvenor, the type from Aberdeen, and var. *rothliebii*, from Fife.—Mr. G. H. Heath, *Anchocelis lunosa*, brown to sand-coloured specimens, Sandown, Isle of Wight.—Mr. G. C. Hodson, *Euchloë cardamines*, male, with the wings split up into alternate stripes of orange-yellow.—Mr. G. C. Hodson, *Aporophyla obelisca*, *Aporophyla australis*, *Anchocelis lunosa*, *Hemerophila (Jaspidea) muralis*, and *Lycæna corydon*, taken on the Isle of Wight, September 8th to 16th. *L. exigua* showed a great variation in ground colour.—Mr. L. B. Prout, *Polia xanthoptera* var. *leucosticta*.—Mr. V. E. Shaw, full-fed larvae of *L. exigua*; also *L. eximia*, from Tyne Valley, some specimens being darker than the Southern form.—Mr. Alfred Sich, *Heliothis peltigera*, *Heliothis oviæ*, the imago having emerged within forty-two hours of the larva.—Mr. H. E. Tautz, *L. exigua*, taken by Mr. A. J. Willsdon, melanic *T. ianthina*, bred *ab ore* from

New Forest; also series of *Orthosia epsilon*, *Miselia oxyacanthea*, *Tenio-campa instabilis*, and *T. opima*, from Epping, the latter including very dark specimens.—Mr. Prout stated that larvae of *L. exigua*, kept in a warm room, had pupated twenty days after emergence from the egg.

November 6th.—Dr. G. G. C. Hodgson exhibited *Thera juniperata* from Surrey, and a long series of *Lycæna ægon* from Witherslack and Ashdown Forest, including an almost grey male, and several aberrant under sides.—Mr. G. H. Heath, *Heliothis peltigera*, Sandown, September, 1906, and *Hadena proteus*, closely resembling Newman's third figure, from same locality.—Mr. L. W. Newman, a long series of *Chrysophanus (Polyommatus) phœas*, Bexley, September and October, 1906, including a golden-coloured specimen, several intermediates between this form and type, and examples of striated, brick-red, and almost white under sides.—Mr. V. E. Shaw, *Asthenia blomeri* from Chalfont Road, June, 1906.—The evening was devoted to the exhibition and exchange of members' duplicates.

November 20th.—Messrs. L. A. E. Sabine and H. B. Whitehouse were elected members of the Society.—Mr. S. J. Bell exhibited two broods of *Hemerophila abruptaria*, bred from pupæ received from Mr. E. Harris. Brood A, from light female and dark male ex light female and dark male, yielded 80 per cent. dark and 20 per cent. light; brood B, from dark female and male ex dark female and light male, yielded 96 per cent. dark and 4 per cent. light. Brood A consisted of 48 per cent. male and 52 per cent. female, but in brood B there were 66 per cent. female and only 34 per cent. male. In over one hundred specimens shown there was nothing approaching to an intermediate form.—Rev. C. R. N. Burrows, nine *Epunda lutulenta*, the only examples of the grey form found among some two hundred specimens taken at Mucking.—Mr. J. A. Clark, *Agrotis ashworthii*, North Wales, August, 1906; and series of *H. abruptaria*, including a gynandromorphous specimen.—Mr. G. R. Garland, on behalf of Mr. Pickett, long series of bred *H. abruptaria*—first, second, and third broods of type, and dark forms from Clapton, including a small slate-coloured male.—Mr. G. H. Heath, *Cerastis spadicea*, Sandown, October, 1906, with pale submarginal line strongly marked.—Mr. L. W. Newman, *Zygæna minos* from North Wales and Oban, June, 1903; also a *Zygæna* taken at Oban at the same time, having six spots on fore wings, but with the fluffy body characteristic of *Z. minos*.—Mr. L. B. Prout, aberrations of *Aporophylla australis*, Sandown, September, 1906, including strongly marked males and female of rare ab. *ingenua*; also six examples of *Acidalia immorata*, bred as a partial second brood from Lewes ova.—Mr. V. E. Shaw, long series of *H. abruptaria* from Holloway, Clapton, and Bexley, including many dark specimens.—In the course of a discussion on *H. abruptaria* it was made evident that the dark form had long been known in the Clapton district, where Mr. E. Harris took the female from which most of the dark specimens exhibited were descended, and that this form was apparently gaining ground there.—S. G. BELL, Hon. Sec.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The usual monthly meeting of this Society was held at the Royal Institution, Liverpool, on November 19th, 1906, Mr. R. Wilding, Vice-President, in the chair.—A paper was communicated by Mr. J. Collins, of Oxford,

embodying his observations upon the habits of *Sitaris muralis*, a beetle associated with the mason bee, *Anthophora pilipes*, with specimens of both taken near Oxford in illustration of the paper. Mr. Collins also sent for exhibition the beetles, *Apion astragali*, *A. sanguineum* *P. 4-pustulatus*, and *Lebia chlorocephala*, as well as the Tortrix *Stigmonota pallifrontana*. — Mr. W. Mansbridge read a paper entitled, "Notes on a melanic race of *Agrotis ashworthii*," and exhibited a long series of moths bred in 1905, in illustration of his remarks; a discussion ensued, and, in further illustration, Mr. F. N. Pierce exhibited *A. candelarum* together with microscopic preparations of the genitalia of both insects, and Dr. Bell showed the preserved larva of *A. ashworthii*. Mr. Mansbridge discussed the evidence for and against the view that *ashworthii* and *candelarum* are the same species, and suggested the name *substriata* to distinguish the new form. The opinion of the meeting was to the effect that more evidence of identity was required, especially as regards early stages and structural detail of *candelarum*. Other exhibitors were Mr. W. A. Tyerman, a box of Lepidoptera including *Pygæra nigra* from Ireland, *Eupithecia isogrammaria* and *Plusia festuca* from Lathone; *Noctua stigmatica* and *N. glareosa*; one of the latter a very rosy specimen, from N. Wales; *Acronycta leporina* var. *melanocephala*, *Notodonta dromedarius* and *Pheosia dictaoides* from Kirby, Lancashire.—Mr. R. Wilding, specimens of the coleopteron *Amara anthobia* from the Liverpool district.—Mr. E. J. B. Sopp, the scarce cockroach *Epilampa burmeister*, taken in the Manchester Docks, and identified by Mr. R. Shelford; *Panchlora virescens* from the Manchester Docks, Hoylake, and Warrington; *Acridium aegypticum* from Birkdale; Mr. Copp also showed, on behalf of Mr. W. J. Lucas, the scarce *Stenobothrus elegans* from the New Forest, and, on behalf of Mr. W. E. Sharp, a nymph of the cockroach *Periplaneta australasiae* from Brockenhurst.—H. R. SWEETING and WILLIAM MANSBRIDGE, Hon. Secs.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—October 15th, 1906.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. G. T. Fountain showed living larvæ and imagines of *Hadena unanimis*, Tr., found on the canal bank at Marston Green and also at Earlswood, at both of which places they were abundant.—Mr. E. C. Rossiter remarked that he had recently come across two broods of *Smerinthus populi*, L., one of which occurred on common poplar, and the whole brood was of the dark variety of the larva, and the other brood was upon an aspen with whitish under sides to its leaves, and all the larvæ belonged to the light form. Mr. S. H. Kenrick said that he had found both forms together on the common poplar.—Mr. S. H. Kenrick showed some Lepidoptera taken on the Cotswolds during a visit at the last Bank holiday, including *Lycæna corydon*, *Poda*, *Drepana cultraria*, F., *Boarmia abietaria*, Hb., and *Psamotis (Botys) hyalinalis*, Hb. He also showed a number of *Lycaenidae* from Java and the Malay Archipelago.—Mr. G. T. Bethune-Baker showed various Lepidoptera, from Devonshire, taken in July. While there, he had very carefully observed *Satyrus semele* ovipositing, with the result that he detected that the eggs were never laid on fresh green grass stems, but near the top of the stump of grass of the previous season.—Mr. Simkins, various Lepidoptera, including a fine

series of *Gastropacha quercifolia*, L., bred from Surrey ova.—Mr. W. Harrison, *Cerura furcula*, Cl., bred from larvæ obtained near Sandwell Park.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

Eighteenth Annual Report of the Delegates of the University Museum
(for 1905). 90 pp.

AMONG the other Reports contained in this volume is that of the Hope Professor of Zoology, Edward B. Poulton, D.Sc., M.A., F.R.S. From this we gather that the number of specimens of all Orders comprised in the Insect Collection is nearly 500,000. From a census taken by Commander J. J. Walker in 1904, Lepidoptera exhibited a total of 112,149, and Coleoptera 194,484; in 1905 he cast the number of insects in the other Orders at 184,075. It will be seen then that the Hope Department of the Oxford University Museum possesses an exceedingly large amount of entomological material, and it is evident that during the year 1905 the Professor and his staff have made very considerable progress in the work of preparing, cataloguing, and arranging this material so as to render it available for study. Besides much other important work that has been accomplished, or in hand, is the revision and arrangement of the Orthoptera by Mr. R. Shelford, who has completed the Blattidæ, and is now dealing with the other groups. Mr. Hamilton H. Druce has named the Lycaenidæ, and the arrangement of the butterflies, as a whole, is nearly finished, the Papilioninae and Hesperiidæ only awaiting attention. As the Professor points out, however, "while one part is being arranged the others are rapidly growing, so that a certain amount of adjustment and rearrangement will always be necessary."

*Melanism in Yorkshire Lepidoptera.** By G. T. PORRITT, F.Z.S.

MELANISM in Lepidoptera is a subject upon which much has been said and written, and many theories have been put forward as to the how and wherefore; but, as Mr. Porritt most justly remarked, "we really know very little about it." He had no definite theory of his own to advance, but he detailed a large amount of information concerning a great number of species, which in Yorkshire, and parts of Lancashire, are melanic, or exhibit a tendency to become so. Referring to *var. doubledayaria*, the black form of *Amphidasya betularia*, he said that in the South-west Riding this had become the dominant form of the species, and in the same area the typical form was now quite rare. "It is most curious, too, that in this species the black form appears to have developed suddenly, *i. e.*, it was not a gradual darkening, as no intermediates were noticed in a wild state."

* Paper read before the Zoological Section, and printed in the Report of the British Association for the Advancement of Science, Section D. York 1906.

Now the species that suffered in this way in Yorkshire at this time were the white varieties that became so strongly melanistic in the same districts—namely, in the south-west—black and white specimens as follows: those in older districts are pale, and the reverse is true. He reared eight or nine of these melanistic forms in 1904, and the same in 1905, but in the case of the remainder he found that they increased in numbers during the collection, and were in fact greater than the non-melanists."

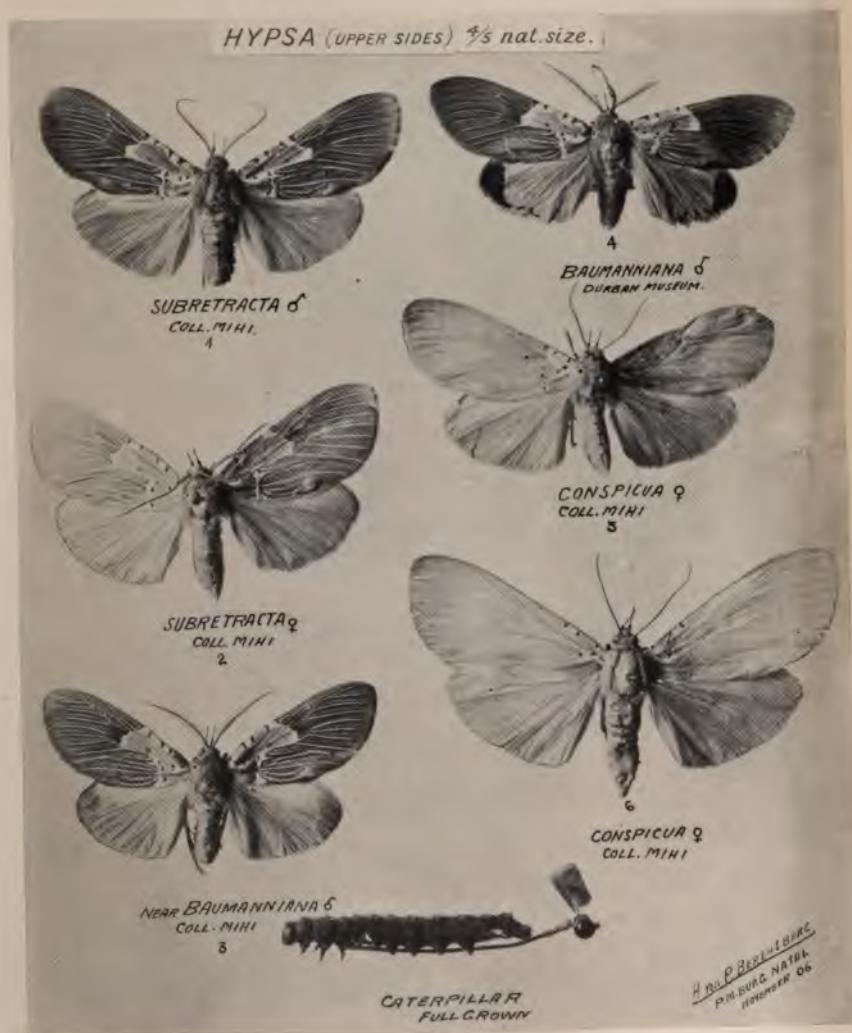
On the matter of breeding transmission, Mr. Porritt gives some interesting observations. In 1904 he reared nine moths from a few eggs deposited by a white female *Chionoptera bidentata*. Six of these were black like the female parent, and the other three of the ordinary form. "Now the black moths in the following year, 1905," he writes, "I reared a very large brood, about 75 per cent. of which were black, and when these again this year [1906] I bred a considerable number of moths the percentage of black was still greater."

Abra *melanchra* is stated to be fast becoming entirely melanic in certain districts in Yorkshire, and it has been found by experiment that when generations reared in captivity have almost entirely eliminated the original form of this species; among seventy specimens reared in the spring of 1906 there were only five or six pale ones.

Again, a male and a female of the largely black variety of *Abraxas grossulariata*, known as ab. *varleyata*, were reared from collected larvae. These parent moths were obtained, and from them a large brood of the moths was reared, all of the parent form, i.e. *varleyata*, and in no instance was any tendency shown of a return to the ordinary or any other form of the species. In the few localities known to yield ab. *varleyata*, apparently of the variety "reared by collectors only average about three or every thousand larvae"; thus the chances of the sexes of the variety pairing in a wild state are exceedingly slender.

Mr. Porritt also points out that, although melanism affects certain species in South-west Yorkshire, other species occurring in the same area, and of which there are melanic forms in other parts of Britain, are in the district he deals with either normal or exhibit a tendency to leucorrhysis. In this connection he instances *Ciduria suffumata*, among other species. Of *C. suffumata*, the dark form *piceata*, which is common in Scotland, and also occurs in North Yorkshire, is scarcely known at all to the collectors in the melanic area of South-west Yorkshire. The species as it occurs there would seem to be becoming paler and generally modified in the direction of the variety, with pale clear ground and dark band, known as the "Dover form."

There is very much more in this exceedingly interesting paper to which we should like to refer, but our readers no doubt will make a point of perusing it themselves. They will find it much to their advantage to do so.



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[No. 525.

ARE *HYPSA BAUMANNIANA* AND *H. CONSPICUA* VARIETIES OF *H. SUBRETRACTA*?

By H. VON FELSER BERENSBERG.

(Office of the Government Entomologist, Pietermaritzburg, Natal.)

(PLATE I.)

DURING the summer of 1903 I found a number of caterpillars, then quite unknown to me, feeding upon the leaves of a cultivated fig-tree in my garden in Pietermaritzburg. I collected them all—a batch of about twenty—from the one tree, and at the time had no doubt in my mind that not only were all the caterpillars identical, but also, from their even size, of the one brood. There were many other fig-trees growing in the garden close by, but there were no caterpillars on these trees, neither then nor later in the season.

Being then in the service of the Railway Construction Department and frequently away from home, I was unable to make any notes upon the larval stage, which was seen through by my wife, who fed the insects daily upon fresh fig-leaves.

The adults emerged satisfactorily and evenly, the majority being typical *Hypsa subretracta*. There were, however, two well-defined varieties, represented by a male insect and two similar females.

Quite recently, in revising my collection of moths, I found in the Durban Museum the genus represented by three species, *H. subretracta* Wlk., *M. conspicua* Swinh., and *H. baumanniana* Karsch., the determinations having been made by Sir. G. F. Hampson, from Natal specimens sent to him by Mr. Quekett. Concerning these I may say that *H. conspicua* is identical with my variety of *H. subretracta* represented by two females, whilst *H. baumanniana* is almost, though not quite, similar to my unique variety (a male).*

* The two specimens of *baumanniana* in the Durban Museum are males, and both specimens of *conspicua* are females, analogous to the specimens in my collection. In these two cases the males incline to the darker

It therefore appears to me that *conspicua* and *baumanniana* are only varieties of *subretracta*. All the circumstances point to this conclusion, unless one is to concede the possibility of two eggs of *conspicua* and one of *baumanniana* having been laid amongst a batch of *subretracta*.

This note is not, however, written with the object of demolishing *baumanniana* and *conspicua*, but rather to draw attention to the facts which have come under my observation, and for the guidance of others who may be able to rear the species. This summer an endeavour will be made to clear the matter up, and a perfectly satisfactory conclusion arrived at.

EXPLANATION TO PLATE.

PLATE I.—Figs. 1 and 2, *Hypsa subretracta*, Wlk.; collection mihi. Fig. 3, *Hypsa* near *baumanniana*; collection mihi. The outer angle of the hind wings shows already the black margin as in a true *baumanniana*, but not so sharply defined, and more suffused. Fig. 4, *Hypsa baumanniana*, Karsch, from Durban Museum, which was identified by Sir G. F. Hampson, the outer margin of the hind wings being black, and sharply defined. Figs. 5 and 6, *Hypsa conspicua*, Swinh.; collection mihi. Fig. 7, Caterpillar of *Hypsa subretracta*, a blown specimen from the Durban Museum. Figs. 1, 2, 3, 5, and 6 are all of moths reared from the same batch of caterpillars.

[The left wing of Fig. 2 is rather light, and the right wing of Fig. 5 slightly too dark, being due to the effect of the sun, when the photos were taken.]

LIFE-HISTORY OF *THECLA PRUNI*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

ON June 23rd, 1904, I received from the late Mr. F. G. Cannon two females of *Thecla pruni*, taken by him the previous day in Northamptonshire. I at once placed them on a small plum-tree. In a week's time I found a few eggs were deposited on the smaller branches at the base of the forks. These exactly resembled little brown buds; they are laid singly, and from one to three on the same fork, but no doubt in a state of nature

variety or *baumanniana*, and the females to the yellow one or *conspicua*. It is noticeable that the females of the typical specimen or *subretracta* are much paler and less sharply marked on the under side of the wings than the typical males. In *subretracta* the black on the under side of the fore wings is less developed than in *baumanniana*, but much more than in *conspicua*, which has only a black transversal blotch at the end of the discoidal cell. One of my *conspicua* has no black at all on the under side, but is entirely yellow. On the upper side the small black dots near the base of the fore wings are very indistinct in this specimen. I send at the same time photographs taken from two typical *subretracta*, one specimen near *baumanniana* and two *conspicua* bred by myself; one *baumanniana* (named by Sir G. F. Hampson), and a caterpillar borrowed from the Durban Museum to demonstrate the variation.

(*i. e.*, not confined to one tree or rather bush of blackthorn upon which the eggs are deposited in a wild state) only a single egg is laid on the same fork, or even branch, by the same parent.

The egg is of a compressed spherical form, $\frac{1}{32}$ of an inch in width, and $\frac{1}{70}$ in. high. The micropyle is sunken and finely pitted. The entire surface is covered with raised irregular reticulations forming a cellular pattern surrounding the micropyle, increasing in size over the rest of the surface into a network pattern, chiefly in the form of hexagons; at the juncture of each mesh is a raised point with a clefted knobbed apex. The spaces between the meshes are granular. The ground colour is pale buff, the reticulations rust-brown, and the points dark brown. During the winter it gradually becomes paler in colour, being in mid-winter a light greyish ochreous, and the points black at the extremities, appearing to the naked eye of a general light grey-brown. They remain unchanged until hatching about the end of March, being nine months in the egg state.

On March 26th and 27th, 1905, the eggs hatched. The larva eats away the central portion of the crown of the egg, leaving a comparatively large hole, and emerges. Directly after emerging, it measures $\frac{1}{20}$ of an inch long, of the usual onisciform shape. The third to ninth segments are humped dorsally, the first and last segments somewhat flattened, and each with a shining black disc. The head is also shining black, and bears a few very tiny bristles. There is a central dorsal furrow and a row of hairs running along each side composed of two hairs on each segment, both curving backwards, the anterior one being twice the length of the other; they have black shining pedestal-like bases. Below these is a minute subdorsal hair, almost touching a double black shining wart. The spiracles are large and shining black. Along the lateral subspiracular region on each segment is a cluster of four hairs of different lengths, each having a shining black bulbous base, and shorter hairs are scattered over the ventral surface and claspers. The whole colouring is lilac-brown, becoming ochreous on the ventral surface. The entire surface is granular, and covered with minute shining points.

Just previous to the first moult it measures only $\frac{1}{14}$ of an inch long. During the first stage it exactly resembles the outer sheath of the bud which remains attached to the base of the young shoot; these are yellow, with rust-brown tips. The larva is of similar coloration, having the fifth, sixth, and seventh segments light ochreous yellow; the remaining segments at each end reddish brown. First moult occurred on April 13th, the first stage occupying eighteen days.

After first moult—twenty-five days old—it measures $\frac{1}{8}$ of an inch long. The first and last segments are rather compressed. The back is humped and considerably elevated, with a central dorsal longitudinal furrow. Each hump has a series of sharply

pointed serrated bristles with pedestal bases; these form a longitudinal fringe along each side of the furrow. The sides are concaved with a prominent lateral ridge, also furnished with a fringe of bristles similar to those on the dorsal surface, and immediately below is another series of long fine simple cream-coloured hairs; both series project laterally; the bristles are ochreous, with blackish tips. Scattered over the body are numerous short bristles and circular discs resembling spiracles. The head is pale ochreous and black. The fifth, sixth, and seventh segments are varied in colouring, with yellowish pale green and pink; the remaining segments are purplish rose. The ventral surface, claspers, and legs are greenish white.

Seven days after the second moult it measures $\frac{1}{4}$ in. long. In shape it is similar to the previous stage. The head is shining black, and while at rest is concealed under the projecting flattened anterior segment. The dorsal area, excepting the fifth, sixth, and seventh segments, is a deep rose colour, and a beautiful rich rose tint exists on the lateral ridge of the second, third, fourth, and fifth segments, becoming white on the sixth, seventh, and eighth segments, and rich rose on the last four segments, extending round the anal extremity. The central third of the body is a pale yellowish green with darker green oblique stripes. On the inner dorsal edge of the fifth, sixth, and seventh segments is a deep rose crescentic mark externally edged with whitish. The spiracles are pale amber-brown. The whole surface is densely sprinkled with minute spines. Along the dorsal and lateral ridges are clusters of much longer spines on each segment, excepting the eleventh. The whole of the ventral surface is of a greenish pearly white. It feeds deeply into the tender shoots of its food-plant. The third and last moult takes place during the last week of May.

After third moult—fully grown—it measures, when crawling, $\frac{5}{8}$ in. long. The head is pearly white, with slight greenish reflections, marked with pale olive in front. The mouth-parts are red-brown and white; eye-spots black. The first segment is compressed and rounded, completely overlapping the head, and indented in the centre, where there is a glazed whitish disc. The body is much elevated dorsally. The second, third, and fourth segments are not humped, but merely sunken in the centre, forming very slight dorsal ridges. The fifth, sixth, seventh, eighth, and ninth segments inclusive are strongly humped, each segment rising to a point on the dorsal ridge, leaving a deep central furrow; these points have each a submarginal crescentic rich deep purple-rose mark on the inner side, and externally outlined with white on the fifth, sixth, and seventh segments. The anal segment has a longitudinal dorsal mark of the same rose colour and a paler rose tint blended round the lateral edge. The ground colour is a clear green, with four

oblique pale yellow-green stripes and a longitudinal lateral line of the same colour. The ventral surface is whitish green, including the legs and claspers. The whole surface above the lateral ridge is densely sprinkled with minute amber-brown spines, each with a fluted pedestal base. They are sparsely serrated and sharply pointed and longest on the dorsal area. On the tenth segment is a much longer pair, each in the middle on the dorsal ridge; these are duplicated on the eleventh segment by a much shorter pair. The spiracles are prominent, of a bright amber-brown. On each segment are a number of tiny greenish glassy discs. The larva in this stage continues feeding almost unceasingly, for several hours' duration I could not detect it stopping. The last stage occupies about ten days.

One pupated on June 7th.

The pupa is short, stout, and humped. It measures $\frac{3}{8}$ in. long, and $\frac{1}{16}$ in. in diameter from third abdominal segment to the ventral surface. Dorsal view: Head slightly notched in front, angular at base of wings, concave at the waist, swollen at the middle of abdomen, and abruptly attenuated to the anal segment. Lateral view: Head pointed in front; thorax swollen and rounded, sunken at the waist; abdomen suddenly rising to third segment, where it is strongly humped, then curves to anal segment; each segment has a subdorsal point, decreasing in size from the third segment; between these and the spiracles are two punctures on each segment; the under surface forms a straight line. Colour: Directly after pupation it is pale greenish, with paler thoracic markings; it gradually darkens, and in about forty-eight hours assumes its normal colouring, which is as follows. The ground colour of the dorsal surface is a clear brown-black, having a rather varnished appearance, becoming ochreous brown by the spiracles and over the wings; it is variegated with white on the prothorax; hind portion of mesothorax and whole of the metathorax, also each side of the first abdominal segment, and speckled with white on the remaining segments bordering the wings; the spiracles are prominent, black and shining. The whole of the dorsal surface is sprinkled with tiny amber-coloured hairs. The wings and ventral surface, excepting the abdomen, are smooth. It is attached to the stem of its food-plant by a silken girdle round the waist, and by the cremastral hooks, to a silken pad. In general form, and especially the colouring, it exactly resembles a bird's excrement, which it undoubtedly mimics.

The pupal state occupies about eighteen days. The one described emerged on June 25th, which is about the normal time for the appearance of this butterfly.

It will be noticed that the larva of *T. pruni*, like others of this genus, moults only three times. I have detected these larvæ in the act of devouring each other. In one instance a

larva in the third stage ate through the base of a leaf upon which a younger specimen was fixed for moulting, and the larger one I found was devouring it greedily. I at once moved it to an adjoining branch, but, curiously enough, it crawled down the branch and up the one from which I removed it, and again attacked the moulting larva in precisely the same manner through the hole in the leaf, and renewed its meal of the identical part of its victim.

DRAGONFLY SEASONS OF 1905 AND 1906.

By W. J. LUCAS, B.A., F.E.S.

IN 1905 there was little new to relate with regard to the British dragonfly fauna. The first specimens observed by me were *Pyrrhosoma nymphula*, on May 7th, and *Libellula quadrimaculata* on May 10th, both at or near the Black Pond in the fir-woods near Oxshott, Surrey. On May 11th Mr. F. Balfour Browne sent me three living specimens of *Agrion armatum*, one male and two females, from the Norfolk Broads. He considered that the "hatch" was rather earlier than in 1904. All three were in somewhat teneral condition. On May 28th *Cordulia ænea* was first seen for certain at the Black Pond, and at the same time and place *Enallagma cyathigerum* was observed. On May 31st the only species noticed on Bookham Common was *Agrion puella*.

In the New Forest, from June 9th till June 13th, *Orthetrum cærulescens* and *Calopteryx virgo* were numerous, the former in teneral condition, and the latter usually so. *Platycnemis pennipes* and *Agrion mercuriale* were found, but *Ischnura pumilio* did not reward my search—apparently it was not out. *P. nymphula* was plentiful, and one var. *æneatum* was met with. Though special quest was made for *Gomphus vulgatissimus*, a single female only was obtained.

On July 2nd *L. quadrimaculata* was in fair numbers at the Black Pond and was still emerging, a few *Anax imperator* were seen, *Pyrrhosoma tenellum* was out though some individuals were in teneral condition. On July 17th *Sympetrum scoticum* and *E. cyathigerum* were taken on Arbrook Common, in the same district.

In the New Forest, during August, dragonflies were, of course, numerous. *A. mercuriale* and *I. pumilio* were taken, though no specimens of the var. *aurantiacum* of the latter were seen. *Æschna juncea* was taken on August 6th, and *P. nymphula* was still on the wing; on the same day an *A. puella* was found caught in the web of a rather small spider, which commenced binding it up, and perhaps may have stung it, for it died shortly afterwards in the collecting-box in which both were

placed. The next morning the spider was found upon the dragonfly, but whether feeding upon it or not I cannot say. On August 21st, the weather not being suitable for dragonflies, a male *Cordulegaster annulatus* was found at rest on a bush with its wings spread, the costal margins of corresponding pairs being in straight lines. Its legs were bunched up, all the tarsi, apparently, being approximated. For some time it did not resent being touched as it hung; later it began to quiver its wings, though with what object was not clear, and being handled again it suddenly took to flight.

At the Black Pond, on September 12th, *Sympetrum striolatum* and *S. scoticum* were numerous and *E. cyathigerum* was not scarce. *Æschnas* were fairly plentiful, and one male each of *Æ. grandis*, *Æ. cyanea*, and *Æ. mixta* were taken, while one that settled on a tree-trunk, judging by its yellowish costa, must have been *Æ. juncea*. The last dragonfly seen was at the same place on November 12th. It was on the wing, and by its size and appearance could only have been *S. striolatum*; but, though it flew near me, it gave me no opportunity of making a capture.

Mr. K. J. Morton was good enough to give me a pair of *Somatochlora arctica*, which he took at Black Wood, Rannoch, on July 19th, and a male *Æschna cærulea* with colour nicely preserved, taken at Learan, Rannoch, on July 14th.

In 1906 the season for me opened even later than in 1905. *P. nymphula* was first seen at the Black Pond on May 13th, and an *L. quadrimaculata* was probably sighted from a little distance the same day. In a fish-globe at home, about May 25th, a nymph of *P. nymphula* (captured in the New Forest), which had appeared ready to emerge for some time, crawled up a stick out of the water about 7 a.m. Having partly emerged, it remained in its "resting" position for a longer time than I have been accustomed to expect for *Agrioninæ*. The rest being over, it did not suddenly complete its emergence, but raised its legs gradually. Then it held the stick with fore and mid-legs, and the head of the nymph-skin with the hind ones, before drawing out the remainder of the abdomen. A few minutes after 8 a.m. the wings had attained about their full length. The specimen was a female.

In the New Forest, from June 2nd till June 5th, with the exception of *P. nymphula*, few dragonflies were noticed. *C. virgo* was in teneral condition; the wings looked dark brown. *G. vulgarissimus* and *I. pumilio* were not found. From nymphs dredged in April near Whitley Ridge Mr. G. T. Lyle bred *L. quadrimaculata* and secured nice photographs of the emergence.

On June 10th, at the Black Pond, dragonflies were few and appeared to be late, but on the evening of June 19th they seemed to be numerous there, and *A. imperator* was seen on the wing about 6.30 p.m. *P. tenellum* was flying at the pond on July 1st.

Mr. H. M. Edelsten was kind enough to give me specimens

of *Orthetrum cancellatum*, captured in July at the Norfolk Broads, where, also, he took *A. isosceles*.

In the latter part of the summer dragonflies were, as usual, very numerous in the New Forest. On July 30th a male *C. annulatus* was seen to settle on a bush quite close at hand. It hung with the costal margins of the wings at right angles to the body and the wings, therefore, partly overlapping. The specimen was feeding on a worker of the wasp, *Vespa vulgaris*, and was in consequence captured with its prey. This species was noticed on the wing at 7.25 a.m. on August 4th and at 7.18 a.m. on August 23rd. It was very common on September 1st. *I. pumilio* was found on August 11th in a new locality in the Forest, some two or three miles from its previously known haunts; while, on August 7th, *A. mercuriale* was discovered in a part of the Forest quite distant from its other known localities, which now number some five or six. On September 1st a few *C. virgo* were still about, chiefly females. *P. tenellum* var. *aeneatum* was taken connected *per collum* with a male, which appears never to be trimorphic like the female, or even dimorphic. Master J. W. Edwards shewed me a specimen of *A. cyanea* that he had captured quite early in August in the neighbourhood of the Itchin at Eastleigh.

On September 24th Mr. R. Adkin sent me three specimens of *S. striolatum* from Eastbourne, and said: "It has become very common here during the past day or two. I have noticed it here each autumn, but this year it seems to be unusually abundant all of a sudden." On October 14th this species and *S. scoticum* were very lively at the Black Pond, and an *Eschna* was seen in the district. About the 19th of the same month, in Kingston-on-Thames, a female *S. striolatum* was seen to settle with a fly in its clutches—apparently a house-fly or a small blowfly. I carefully approached and caught the dragonfly in my hand, but she let go the fly, which was not so badly damaged as to prevent its flying sharply away. My last dragonfly of the season—no doubt an individual of the species last mentioned—was seen near Byfleet, in Surrey, on November 2nd.

In the previous volume of the 'Entomologist,' pages 281-2, Messrs. H. and F. Campion have given a full account of their interesting captures of *Sympetrum flaveolum* and *S. vulgatum* in Epping Forest.

In 1906, I understand from Mr. F. Balfour Browne, *A. armatum* and *A. isosceles* were common at the Norfolk Broads. The latter, he says, is quite common every season, and there are places where it is the commonest species. It disappears somewhat early in the season, and is replaced by *A. grandis*.

Mr. R. J. Wallis has secured specimens of the dragonflies that occurred during 1906 in the gardens of the Royal Horticultural Society at Wisley, in Surrey. I find that they consist

of *Æ. cyanea* (one male), *L. quadrimaculata*, *S. scoticum*, *Calopteryx splendens*, *P. nymphula*, *A. puella*, and *Ischnura elegans*.

Mr. K. J. Morton tells me that in July, 20th to 30th, at Emyvale, co. Monaghan, dragonflies were numerous, the species being *S. striolatum*, *L. quadrimaculata*, *Æ. juncea*, *Æ. grandis*, *C. splendens*, *Lestes sponsa*, *P. nymphula*, *I. elegans*, *Agrion pulchellum*, and *E. cyathigerum*.

Kingston-on-Thames: January, 1907.

NEW ABERRATIONS OF ASTHENA TESTACEATA,
DON. (SYLVATA, HB.).

BY EUSTACE R. BANKES, M.A., F.E.S.

I AM indebted to my friend, Mr. Edward Goodwin, for the opportunity of examining a few most interesting and beautiful aberrations, taken by him in a very restricted area in Mid-Kent during 1903-4-5, of the species generally known in this country as *Asthena sylvata*. Authors are by no means agreed as to its correct generic or specific names, but the question of nomenclature is outside my present purpose. These aberrant forms, which occur alike in both sexes, and appear to be undescribed, fall into two main groups, which may be characterized as follows:—

1. Ab. *intermedia*, n. ab.—Both fore and hind wings have the whitish ground colour, which still prevails, more thickly and generally dusted with dusky brown, especially along the costa of the fore wing, and have the transverse dusky brown lines more strongly pronounced, than in the typical form.

2. Ab. *goodwini*, n. ab.—All the wings are so generally and thickly dusted with dusky brown that the whitish ground colour is largely obscured by it, especially towards the costa of the fore wings; this, however, tends to be less so along the actual termen, and near the tornus, of both fore and hind wings, than elsewhere. The tawny fasciæ on both the fore and hind wings are, however, still quite visible.

The individuals in question, though all are referable either to ab. *intermedia* or to ab. *goodwini*, vary considerably *inter se*, and practically show every gradation between the typical form and complete melanism. In the darkest example of ab. *goodwini* the normally pale ground colour has almost disappeared, and the head, collar, thorax with tegulæ, and abdomen are, like the wings, dusky brown above, though this last is prettily barred with white, and has an ochreous anal tuft. The sight of this specimen at once suggests the idea that before long we shall hear of an extreme aberration in which the whitish ground colour has entirely disappeared, and this is rendered all the

more probable by the fact that Mr. Goodwin—after whom I have the pleasure of naming the most striking of the two forms under notice—has taken at least two individuals darker than any that he could submit to me; these, however, being females, were kept for ova (which alas! proved infertile), and consequently were useless for the cabinet. I also learn from him that the insect is not common in the locality that produces these remarkable aberrations, and that only about 10 per cent.—or possibly 15 per cent.—of the specimens met with there are, to a greater or less extent, darker than the type.

These dusky *A. testacea* furnish additional proof of the unexpected wealth of Kent in melanic forms of Lepidoptera, to which I called attention in Ent. Mo. Mag. ser. 2, xvi. 90 (1905).

Norden, Corfe Castle : January 19th, 1907.

A NEW MOSQUITO FROM INDIA.

By S. ROTHWELL.

Neocellia intermedia, n. sp.

Head deep brown clothed with grey scales in front, and a grey projecting tuft. Palpi brown, with two broad apical, and two narrow basal white bands. Thorax slaty-grey in the middle, deep brown on each side, with pale scales. Abdomen brown, with pale creamy and ochreous scales and golden hairs. Legs brown, speckled and banded with cream colour, tarsal banding very minute on the brown hind legs. Wings with four large costal spots, the two apical ones spread evenly on to the first long vein; the second has two small spots under it on the first long vein, the second has two small spots under it on the first vein and the third one.

♀. Head densely clothed with upright white forked scales in front, black ones behind, a few white curved ones in front with a long irregular tuft of hair-like ones projecting forwards; antennæ deep brown, with numerous small white scales and hairs on the basal segments; palpi brown, with two broad bands towards the apex, and two narrow ones on the basal half, the two broad ones separated by a narrow black ring; proboscis black, pale at the apex. Thorax slaty-grey in the middle, deep brown at the sides, clothed with broad curved, rather flattened creamy scales, pale golden chætae over the roots of wing; scutellum slaty-grey, paler at the sides, with similar scales to the mesothorax and brown border bristles; metanotum deep brown; pleuræ brown, with grey sheen and some flat creamy scales. Abdomen brown, with narrow, curved, creamy scales becoming densest on the apical segment, and with pale hairs. Legs brown; the femora and tibiæ with yellow spots; the fore metatarsi with three yellow spots, one apical; the first and second tarsals with

minute apical yellow bands; the mid-legs much the same, the hind with minute yellow apical bands to all the tarsi but the last. Wings with four large black costal spots and one or more smaller basal ones, the second and third about equal, the first smaller, the fourth rather larger than the first; the first and second spread evenly over the first long vein, the third spreads evenly on to the subcostal, and only partly on to the first long vein at its apical end on two small spots, fourth evenly on the first vein, the small basal one confined to the costa; most of the vein yellow-scaled; a dark spot on the upper branch of the first fork cell just under the apical costal spot; a small dusky patch on each side of the cross-vein; the third with an apical spot and another on each side of the cross-vein, two on the upper and two on the lower branch of the second fork-cell, and many dark scales on the stem; the upper branch of the fifth has a small apical spot and small ones on each side of the cross-vein, and one on the apex of lower branch; sixth with three black spots. Fringe with pale areas, at the ends of all the veins except the sixth. First submarginal cell longer and narrower than the second posterior cell, their bases nearly level; the first fork-cell is contracted at the apex, its stem as long as the cell, stem of the second longer than the cell; supernumerary cross-vein in front of the mid, and the mid further in front of the posterior cross-vein. Length, 5-5·5 mm.

♂. Head brown, with white upright forked scales in front, darker ones behind and at sides; a tuft of long white scales projecting forward between the eyes. Proboscis long and thin, dark brown in colour, with a pale apex. Palpi with two distal segments swollen or club-shaped; palp mottled with grey and brown scales, which more or less form into bands. Last two segments grey, with a thin brown band in the middle. Antennæ plumose, with last two segments long and pilose, plumes light brown; a few scales present on the basal segments. Thorax ashy-brown, with grey broad-curved scales; sides dark brown; scutellum slaty-grey, paler at the sides, with broad-curved scales and dark brown bristles. Metanotum deep brown. Abdomen light shining brown, with darker apical borders to segment. Narrow curved scales scattered over the abdomen, also golden hairs. Genitalia with claspers curved apically, a longish median process between the basal lobes. Legs mottled with yellow and brown scales; pale apical bands to tibiae and to the first three tarsals. Wings with three large black costal spots and two smaller ones; the second and fourth about equal in size; first very small; the third the largest. Other wing-spotting as follows: a dark spot on the upper branch of first fork-cell; basal half of lower branch dark; small spot on the stem of the cell; on the third long vein is an apical spot, and one on each side of cross-vein, two on the upper and two on the lower branch of second fork-cell, with stem of cell mostly dark; upper branch of fifth vein with two spots, one each side of the cross-vein; two dark spots on sixth long vein. Fringe with pale areas at the ends of all veins. First submarginal cell longer and narrower than second posterior cell, its stem slightly longer than the cell; the apex of cell is slightly contracted; stem of second posterior cell nearly twice the length of cell. Posterior cross-vein twice its own length from mid cross-vein; supernumerary in front of mid. Length, 5·5 mm.

Habitat.—Deesa.

Observations.—Described from three females and a single male sent to Prof. F. V. Theobald by Major C. G. Nurse. The male specimen was not in a very good state, some of the legs being absent. The three females show some variation in wing markings, especially in the spots under the large costal spot, and in the size of the wings. The first submarginal cell is markedly contracted at the apex.

COLEOPHORA TRICOLOR, WLSM., AT SEAFORD,
SUSSEX.

BY PHILIP J. BARRAUD, F.E.S.

I SHOULD like to record the capture of two specimens of the above-named moth at Seaford on July 9th, 1905. These were taken by my friend Mr. T. F. Furnival, who is now in South Africa, and who gave me his collection of Lepidoptera before leaving this country. The specimens have been kindly identified for me recently by Mr. Eustace R. Bankes.

Bushey Heath, Herts : January 7th, 1907.

NOTE ON COLEOPHORA TRICOLOR, WLSM.

BY EUSTACE R. BANKES, M.A., F.E.S.

THE capture of *Coleophora tricolor* in Sussex is of the greatest interest, for hitherto there has been no evidence of its occurrence outside the county of Norfolk, where it was taken, amongst mixed rough herbage on the Breck sands, by Lord Walsingham [who described it in Ent. Mo. Mag. ser. 2, x. 201 (1899)], and was subsequently met with by Mr. E. A. Atmore. *Tricolor* could hardly be confused with any known British species except *lixella*, but this it resembles so remarkably closely that it can only be satisfactorily separated therefrom by certain antennal differences, the most obvious of which is that the pale antennæ have the terminal two-thirds completely ringed with brownish-grey, whereas in *lixella* the corresponding portion, although dark-spotted on the under side, never shows dark annulations.

I am much indebted to my friend, Mr. Philip J. Barraud, for most kindly adding one of the Seaford specimens to my collection, and earnestly hope that we may, in the near future, hear of the discovery of the larva and food-plant of *C. tricolor*, for no *Coleophora* larva ought to be able for long to defy detection.

Norden, Corfe Castle : January 12th, 1907.

CURRENT NOTES.

By G. W. KIRKALDY.

(Continued from vol. xxxix., p. 287.)

58. DISTANT, W. L.: "The Fauna of British India. . . . Rhynchota." Vol. i., pp. i.-xxxviii. and 1-438, text-figs. 1-249 (— 1902); vol. ii., pp. i.-x. and 1-242, text-figs. 1-167 (Dec., 1903), and pp. i.-iv., xi.-xvii. and 243-503, text-figs. 168-319 (— 1904); vol. iii., pp. i.-xiv. and 1-503, text-figs. 1-266 (— 1906) [Hemiptera].
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60. STRETCH, R. H.: "Heterocera americana." *Op. cit.*, 117-25, plates ii.-xii. (Sept., 1906). [Lepidoptera].
61. CHILTON, C.: "Note on the Occurrence in New Zealand of Dipterous Insects belonging to the Family Blepharoceridae." T. N. Zealand Inst. xxxviii. 277-8, plate xlvi., figs. 1-2 (June, 1906).
62. HUDSON, G. V.: "Notes on Insect Swarms on Mountain-Tops in New Zealand." *Op. cit.*, 334-6 (June, 1906).
63. CROMBRUGGHE DE PICQUENDAELE (Baron de): "Catalogue Raisonné des Microlépidoptères de Belgique." Parts 1 and 2. Mém. Soc. Ent. Belg. xiii. 1-172 and xiv. 1-155 (1906). [Lepidoptera].
64. MAYER, P.: "Zoologischer Jahresbericht" for 1905: Arthropoda, pp. 1-71 (1906).
65. LUCAS, R.: "Bericht über die wissenschaftlichen Leistungen im Gebiete der Entomologie" for 1901, pp. 285-972 (1906!). [Lepidoptera, Hymenoptera].
66. SEIDLITZ, G.: Ditto for 1904. Pp. 1-360 (1906). [General and Coleoptera].
67. SCHROTTKY, C.: "Eine merkwürdige Monstrosität an *Carineta formosa*, Germ." Wien. Ent. Zeit. xxv. 261-2, figs. 1-2 (Aug. 15th, 1906). [Hemiptera].
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71. "Map of the Region of the Panama Canal" (in five colours, 24 in. by 33 in.), Supplement to ditto (Oct., 1905).
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73. SHIRAS, G.: "Photographing Wild Game with Flashlight and Camera." *Op. cit.*, 367-428, 74 views (July, 1906).
74. BAILEY, S. I.: "New Peruvian Route to the Plain of the Amazon." *Op. cit.*, 432-48, with coloured map of South America and 12 views (Aug., 1906).
75. MORGAN, T. H.: "An Alternative Interpretation of the Origin of Gynandromorphous Insects." *Science* (2) **xxi**. 692-5, 3 figs. (April 21st, 1905).
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77. THIENEMANN, A.: "Biologie der Trichopteren-Puppe." *Zool. Jahrb. Syst.* **xxii**. 489-574, plates 16-20 (1905).
78. BRUES, C. T.: "Notes on the Life History of the Stylopidae." *Biol. Bull. Woods Hole* **viii**. 290-5, figs. 1-2 (1905). [Coleoptera].
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80. HOLMES, S. J.: "The Reactions of Ranatra to Light." *J. Comp. Neurol. Granville* **xv**. 305-49, 6 figs. (1905). [Hemiptera].
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82. GREEN, E. E.: "Millipede killed by Reduviid Bug." *Spol. Zeylan.* **ii**. 159 (1905). [Hemiptera].
83. KREIDL, A., and REGEN, J.: "Physiologische Untersuchungen über Thierstimmen. Stridulation von *Gryllus campestris*." *Sb. Ak. Wien* **cxiv**. pp. 57-81, 1 plate (1905). [Orthoptera].
84. RÖHLER, E.: "Beiträge zur Kenntniss der Sinnesorgane der Insekten." *Zool. Jahrb. Morph.* **xxii**. 225-88, plates 15-16 (1905). [Orthoptera, Diptera].
85. VOSS, F.: "Über den Thorax von *Gryllus domesticus*" Parts 2-4. *Zeit. Wiss. Zool.* **lxxviii**. 355-521 and 645-759, 8 plates and 31 figs. (1905). [Orthoptera].
86. HANCOCK, J. L.: "The Habits of the Striped Meadow Cricket (*Oecanthus fasciatus*, Fitch)." *Amer. Nat.* **xxxix**. 1-11, figs. 1-8 (1905). [Orthoptera].
87. MARCHAL, P.: "Observations biologiques sur un Parasite de la Galéruque de l'Orme, le *Tetrastichus xanthomelænae*, Rond." *B. S. E. France*, pp. 64-8 (1905). [Coleoptera].
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der Geselligkeit im Thierreiche." C R. 6 Congr. Internat. Zool. 674-89 (1905). [Hymenoptera].

89. PETERSEN, W. : "Über die Bedeutung der Generationsorgane für die Entstehung der Arten." *Op. cit.*, 213-24 (1905). [Lepidoptera]. (To be continued.)

NOTES AND OBSERVATIONS.

THE MAZARINE BLUE (NOMIADES SEMIARGUS) IN WALES. — I write the "Mazarine Blue" advisedly, because the English names are the only abiding feature in the nomenclature of our British butterflies. In South's 'Butterflies of the British Isles' it is stated, page 178, that "probably the latest captures in Britain were the specimens taken in Glamorganshire in the years 1874-77." It may be of interest to record that in the latter year I received from a correspondent in Cardiff, whose name I have completely forgotten, a male specimen of this rare insect, in exchange for some duplicates in my possession. What those duplicates were I have no distinct recollection, but nothing in comparison with the specimen I received. My correspondent informed me that it and a few others had been taken by himself in the hill country close to Cardiff in that year or just previously. It was a male, in bad condition so far as the setting was concerned, and was without an abdomen. Alas! it has long since disappeared from my collection; but I well remember that the wings were of rather a bright blue with no purplish or violaceous tinge. I do not know whether the insect figured by Mr. South was an English specimen, but I think the purple tinge is rather too pronounced. It would, I feel sure, be of considerable interest if further notes regarding the last captures of this insect were put on record, and where the insects may be seen. It seems to me somewhat strange that such a widely distributed and common butterfly on the Continent should become extinct in the British Isles for no apparent cause.—(Lt.-Col.) N. MANDERS; R.A.M.C., Mauritius.

[The figures referred to are reproductions of coloured drawings, by Mr. Horace Knight, from old British specimens. In printing, the red stone is slightly over much in evidence.—ED.]

INSECT FAUNA OF DEVONSHIRE.—The Section Insecta, pp. 163-244, in 'A History of Devonshire,' a recent volume of "The Victoria History of the Counties of England" series, is a valuable addition to our knowledge of the distribution of insects in England. The lists, chiefly annotated, of the various Orders have been carefully prepared by well-known specialists, and are as follows:—Orthoptera, by George C. Bignell, F.E.S.; Neuroptera, by Charles A. Briggs, F.E.S.; Hymenoptera, by G. C. Bignell, F.E.S.; Coleoptera, by the Rev. Canon Fowler, M.A., D.Sc., F.L.S., &c.; Lepidoptera, by the late Charles G. Barrett, F.E.S.; Diptera, by Ernest E. Austen; Hemiptera, by G. C. Bignell, F.E.S. Mr. Bignell's articles on Gall Makers, and on Parasitic Hymenoptera are interesting and instructive. We must again express regret that the faunistic sections of these county histories are not published separately, at a popular price, so that they might become more readily accessible to the entomological public.

CAPTURES AND FIELD REPORTS.

LITHOSIA CANIOLA NOT IN HAMPSHIRE.—In the 'Entomologist' for December, 1906, I recorded the capture, at Bournemouth, of *L. caniola*. With the help, however, of a more experienced entomologist, further investigation satisfies me that my specimen is *L. stramineola*, and I am sorry that Hampshire cannot claim the former insect for its list. My friend was able to assure me that an insect which I took in my dining-room here, June 30th, 1906, is indeed an excellent specimen of *Eupithecia innotata*.—(Rev.) A. DAY; The Vicarage, Malvern Link.

LEUCANIA VITELLINA IN WEST CORNWALL.—Mr. W. A. Rollason, of Truro, asks if his capture of *L. vitellina* in September, 1906, is a record for the county of Cornwall. In reply, I may say that it is the first published, but I captured two specimens in South Devon, and one in West Cornwall, in the autumn of 1889. A record of these was sent to a periodical then only started a few months, but it was not inserted. I, however, received a letter, in which the writer stated that *L. vitellina* was not taken so far north as Britain. In the same autumn a specimen was taken at sugar in the Isle of Wight, and that capture was mentioned in most of the entomological magazines. I may add that I have six specimens of *L. vitellina* in my collection, all taken about three miles beyond Penzance, in an old orchard about three hundred yards from the sea. The late Mr. Baily also took one in the same orchard, but too late to be included in his list of Lepidoptera of West Cornwall.—WILLIAM DAWS; 89, Newwood Street, Mansfield, Notts.

PLUSIA MONETA IN NOTTINGHAMSHIRE.—I took a specimen of *P. moneta*, at light, on July 21st last.—F. J. RASELL; Weedon Road, Northampton, January 21st, 1907.

LEPIDOPTERA OF EAST SUTHERLAND.—The following is a list of species taken during 1906 (July excepted), within a ten mile radius of Golspie. On reference to Meyrick's 'Handbook' I find that many of the insects mentioned by me do not appear to be recorded north of Ross-shire, and others not even so far north as that county:—

Argynnis aglaja, singly. *A. euphrosyne*, sparingly. *Pyrameis cardui*, singly. *Satyrus semele*, common; resting on stones of old sea-beach, now some three hundred yards from present high-tide line. Slightly darker than the writer's English and Welsh specimens. *Epinephele ianira*, sparingly. *Cænonymphma typhon*, sparingly, on heaths and on damp sides of lochs. *Thecla rubi* fairly common on heaths and mountain slopes. *Chrysophanus phœnas*, sparingly. *Lycæna alexis (icarus)*, sparingly. *Pieris napi*, *P. rapi*, *P. brassicæ*, fairly common. *Hepialus lupulinus*, *H. humuli*, common. *Phragmatobia fuliginosa*, *Spilosoma lubricipeda*, *S. menthastræ* sparingly; larvæ fairly common on plantain. *Pæcilocampa populi*, singly in November, to light. *Lasiocampa quercus*, imago sparingly, larvæ commonly. *Rumia luteolata*, abundant. *Metrocampa marginalaria*, singly. *Elloptia prosapiaria*, *Boarmia ripandata*, sparingly. *Dasydia obfuscaria*, singly. *Ematurga atomaria*, common. *Bupalus piniarius*, male common, female sparingly. *Abraxas grossulariata*, *Lomaspiis marginata*, sparingly. *Oporabia dilutata*, common; all very pale specimens. *Larentia didymata*, the most abundant species. *L. multistriaria*, sparingly. *L. cæsiata*, abundant,

flying from trunks of *Pinus sylvestris*. *L. olivata*, singly. *L. viridaria*, common. *Emmelesia ajanitata*, singly. *Thera variata*, abundant, flying from trunks of *Pinus sylvestris*. *Ypsipetes sordidata*, singly. *Anticlea nigrofasciaria* (*derivata*), single specimen in newly emerged condition, June 9th. 1906. *Coremia munitata*, singly. *Camptogramma bilineata*, *Cidaria corylata*, sparingly. *C. truncata*, fairly common; very variable specimens. *C. immanata*, fairly common. *C. siliceata*, singly. *C. testata*, fairly common. *C. fulvata*, abundant. *Eubolia limitata*, (*mensuraria*), sparingly on ragwort; much darker and richer colouring in fore wings than southern specimens. *Chesias spartiata*, single specimen to light. *Platypteryx falcataria*, sparingly; larvæ common. *Aeronycta psi*, common; larvæ frequent on pear. *Leucania conigera*, *L. comma*, *L. impura*, *L. pallens*, all common, on ragwort. *Hydræcia micacea*, common on ragwort; very variable colours in fore wings. *Xylophasia rurea*, common, on ragwort. *X. monoglypha*, very common on ragwort. *Charæas graminis*, sparingly on heaths and ragwort; all specimens larger and darker than English and Welsh. *Apamea unanimis*, singly, on ragwort. *A. didyma* (*oculea*), *Miana strigilis*, *M. literosa*, common, on ragwort. *Grammesia trigrammica* (*trilinea*), singly, on ragwort. *Caradrina morphæus*, *C. quadripunctata*, sparingly, on ragwort. *Agrotis corticea*, singly, on ragwort. *A. nigricans*, abundant, on ragwort. *A. tritici*, *Triphæna ianthina*, sparingly, on ragwort. *T. comes* (*orbona*), common, on ragwort; fore wings very variable shades of rich red to brown. *T. pronuba*, common, on ragwort. *Noctua confusa*, common on ragwort; very variable. *N. xanthographa*, abundant, on ragwort. *Cosmia trapezina*, sparingly, on ragwort. *Celæna haworthii*, commonly during one week in August, not seen before or after. *Agrotis strigula* (*porphyrea*), singly, on heather. *A. simulans*, *Noctua glareosa*, *N. plecta*, singly. *N. baja*, sparingly. *Anchocelis helvolæ* (*rufina*), *Xanthia flavago* (*silago*), singly. *Dianthæcia capsicola*, common in larva stage; sparingly in imago. *Polia chi*, common, on stone walls; dark specimens. *Epunda nigra*, *Hadena adusta*, sparingly. *H. glauca*, singly. *Plusia chrysitis*, sparingly. *P. bractea*, singly, on phlox in evening. *P. festucae*, specimen seen, not captured; bright sunshine. *P. gamma*, abundant. *P. interrogationis*, sparingly; in rapid flight over heather, with sudden drops (into heather). *Amphipyra tragopogonis*, sparingly.

LARVÆ.—*Notodonta dromedarius*, common, birch and alder. *N. ziczac*, common, alder. *N. camelina*, common, alder and birch. *Dicranura vinula*, singly, birch. *Platypteryx lacertinaria*, abundant, birch.—M. A. ROLLASON; Drummie, Golspie.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, January 23rd, 1907.—At the Annual Meeting of this Society it was announced that the following officers and other members of the Council had been elected for the session 1907-8:—President, Mr. C. O. Waterhouse; Treasurer, Mr. A. H. Jones; Secretaries, Mr. H. Rowland-Brown, M.A., and Commander J. J. Walker, R.N., M.A.; Librarian, Mr.

G. C. Champion, F.Z.S.; Council, Mr. G. J. Arrow, Mr. A. J. Chitty, M.A., Dr. T. A. Chapman, M.D., Mr. W. J. Kaye, Dr. G. B. Longstaff, M.D., Professor Raphael Meldola, F.R.S., Mr. F. Merrifield, Mr. G. A. K. Marshall, Mr. L. B. Prout, Mr. E. Saunders, F.R.S., Mr. R. Shelford, M.A., and Mr. G. H. Verrall.—The outgoing President, Mr. F. Merrifield, then delivered his Address, in which he discussed some of the causes of the persistent abundance or scarcity, generally or locally, of species and varieties of insects, and the relative importance of the consumption of their food and the attacks of their enemies. Reference was made to striking characters that seemed of no biological importance; to habits and activities not directly concerned with nutrition or reproduction, and the manner in which they are affected by external conditions; and to structure and fixed habits indicating their ancestral history and affecting their present capabilities.—H. ROWLAND-BROWN, M.A., Hon. Sec.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—December 18th, 1906.—Mr. Hugh Main, B.Sc., Vice-President, in the chair.—Messrs. Harrison and Main exhibited (1) series of *Anticlea rubidista* from North Cornwall and from Devon, the former less red and generally greyer; and (2) a bred series of *Chesias sparviiata*.—Mr. Goultoun, photographs of larvæ in their feeding and resting positions.—Mr. Garrett, series of *Euchloë cardamines*, *Lycana (Agriades) corydon*, *Augiades (Urbicola) comma*, *Triphæna fimbria*, and *Limenitis sibylla*; the last-named from Arundel.—Mr. Kaye, a number of Syntomid moths from British Guiana, which showed strong constriction, or colour simulating constriction, in the basal segments of the abdomen, thus much resembling species of Hymenoptera, of which many were also exhibited.—Messrs. Rayward and Tonge, ova of *Zephyrus (Bithys) quercus*, in situ, below the winter-buds of oak. They were from Ranmore Common.—Mr. Turner pointed out wintering cases of *Coleophora lutipennella* on the same buds, all extremely small.—Mr. Sich, specimens of *Tinea palescentella* and gave notes on its occurrence, exhibiting *Gelechia pinguinella*, and *Borkhausenia pseudospretella*, which much resemble it in general appearance.—Mr. Newman, (1) a long bred series of *Caradrina (Laphyga) exigua*, with captured specimens for comparison, and a living *Stauropus fagi*, which emerged on December 9th.—Mr. Jennings, a series of *Otiorrhynchus blandus* from the Isle of Man.—Mr. Carpenter, (1) a *Pieris brassicae* with the discal spot connected with the apical patch; (2) a bred series of *Melitaea athalia*; and (3) a series of *Plusia moneta* bred from larvæ found in his own garden.—Mr. East, J.P., gave an interesting account of the Victoria Falls of the Zambesi in explanation of a large number of lantern-slides exhibited by him.

January 10th, 1907.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. John Anderson, of Balham, and Mr. B. Richard, of Rotherhithe, were elected members.—Messrs. Harrison and Main, a long series of *Cidaria minta* bred from New Forest ova, and showing much variation in tone and mottling.—Mr. Newman, a large number of bred *Notodontia chaonia*, showing a good deal of variation in colour and banding.—Mr. Dods, Lepidoptera from Africa, including *Papilio demolens*, *Deiopeia pulchella*, *Danaïs dorippus*, &c.—Mr. Main, photographic stereoscopic views of natural objects.—Mr. R. Adkin, a speci-

men of *Epinephele ianira*, in which the usual tawny markings were of a straw-colour and somewhat extended.—Mr. Turner, a number of remarkable Hemiptera from South America, including mimics of beetles, seeds, thorns, &c., and the interesting moth-like species *Pacifoptera phulanoides*.—He also showed a *Cænonymphia pamphilus* from Chipstead having pale patches on all four wings, and a series of *Vanessa (Aglais) urticæ* showing restricted blue lunules in specimens from Engleberg and Lapland.—Reports of the various field meetings of the Society held during 1906 were read.—Mr. Adkin read a paper entitled "Further Notes on the Occurrence of *Tortrix pronubana* in England."—Hr. J. TURNER, *Hon. Report Sec.*

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—
December 4th, 1906—Annual Meeting.—Mr. W. Bloomfield exhibited *Lomaspilis marginata* with black marginal blotch intersected by a white line.—Mr. H. M. Edelsten, *Lithosia muscerda*, *L. caniola*, *L. com-planula*, *L. griseola*, and var. *stramineola*, all bred ab ovo.—Mr. G. H. Heath, *Lophygma exigua*, from Sandown, Isle of Wight.—Mr. V. E. Shaw, *Apamea basilinea*, from Wye Downs, June, 1906, including a very pale specimen with obsolete orbicular and reniform only partially outlined.—Mr. A. Sich, *Gelechia pingueella* and *Borkhausenia pseudospretella*, to show the close resemblance between the two species, which he differentiated by several points, one of these being that in the hind wings of the former nervures six and seven spring from a common stalk, while in the latter these nervures are parallel.—The following executives were elected for 1907: President, Mr. A. W. Mera; Vice-Presidents, Dr. T. A. Chapman and Messrs. J. A. Clark, F. J. Hanbury, and L. B. Prout; Treasurer, Mr. C. P. Pickett; Librarians, Messrs. G. H. Heath and V. E. Shaw; Curators, Mr. T. H. L. Grosvenor and Dr. G. G. C. Hodgson; Secretaries, Messrs. S. J. Bell and E. Harris. Non-official Members: Rev. C. R. N. Burrows and Messrs. A. Bacot, H. M. Edensten, J. Riches, and P. H. Tautz.

December 18th.—Mr. A. Harrison exhibited a brood of *Pieris brassicæ*, reared from ova laid by typical Liverpool females. Many of the females had black spots on fore wings connected by black scales on both upper and under surfaces, a continuous band being formed in a few extreme examples; the same peculiarity was exhibited to a lesser degree in a few of the males.—Dr. G. G. C. Hodgson, Australian Lepidoptera, including *B. sugriva*, which species has long slender tails to hind wings and ocelli on under side at the anal angle; the species rests either head downwards or horizontally, and Dr. Hodgson remarked that this fact, coupled with the fact that all the specimens observed were more or less damaged near the anal angle of the hind wings, suggested that birds were deceived by the resemblance of the tail end of the insect when at rest to a head with outstretched antennæ.—Mr. L. B. Prout, a long series of British *Larentia cæsiata* and examples of this species from various European, American, Asiatic, and Australian localities, in illustration of the paper read by him on this occasion on the species in question.—Mr. A. J. Willsdon, *Oporina croceago* bred from Kent ova, which were of typical orange colour, while others bred from New Forest ova were of a pale salmon-pink colour.

January 1st, 1907.—The first meeting of the year was devoted, as usual, to a "pocket-box" exhibition, which met with less than the usual support, owing, doubtless, to the inclement weather and the fact of its being New Year's day.—Rev. C. R. N. Burrows exhibited abnormally small specimens of about a dozen species of Lepidoptera, including *Agrotis puta*, *A. saucia*, *Plusia gamma*, and *P. chrysitis*; these were taken in September, 1906, and the exhibitor attributed their dwarfed appearance to the exceptionally dry and hot season.—Mr. S. J. Bell, a series of *Polia chi* taken on moors near Whitby during latter half of August. The species was abundant on the dark stone walls common to the district, but no dark specimens were seen.—Mr. H. M. Edelsten, very dark *Acronycta menyanthidis* from Yorks.—Mr. T. H. L. Grosvenor, *Argynnis selene* from Ashdown Forest, including male with confluent marginal spots, and a female much suffused with black scales.—Dr. G. G. C. Hodgson, long series of *Lycæna corydon*, *L. bellargus*, *L. alexis*, and *L. agon*, arranged so as to demonstrate parallel variation.—Mr. L. A. E. Sabine, two specimens of *Thyatira batis*, the one from Epping with accentuated pink coloration, and the other from New Forest with this colour entirely lacking; the latter thus representing the Linnæan type.—Mr. V. E. Shaw, *Sesia chrysidiiformis*, Folkestone, July, 1906, and *Pieris crataegi*, East Kent, July, 1906; also *Lyta vesicatoria*, which was found in abundance near Dover in July, 1906.

January 15th.—Mr. J. A. Clark exhibited a specimen of *Tænicampa cruda* var. *haggerti* (Tutt).—Mr. E. A. Cockayne, *Thera variata*, with interrupted central fascia, from Rannoch; also *Arctia fuliginosa* var. *borealis* from same locality.—Mr. H. M. Edelsten melanic examples of *Hemerophila abruptaria* from Clapton, *Nonagria geminipuncta* from Enfield, and *N. typhæ* and *N. canna* from Norfolk Broads.—Mr. T. H. L. Grosvenor, *Lycæna agstis* ab. *ornata* from Surrey, and vars. *alpina* (?) and *obscurata* from Aberdeen.—Mr. A. Harrison, melanic specimens of about twenty species, including *Cymatophora duplavis* and *Acronycta leporina* from Cornwall and Lancs, *A. rumicis* from Westmoreland and Barnsley, and *A. nebulosa* from Cornwall, Epping, and Delamere.—Mr. L. W. Newman, a large number of melanic Lepidoptera, including *Stauropus fagi*, *Boarmia consortaria*, *Odontopera bidentata*, and *Boarmia abietaria*.—Mr. L. A. E. Sabine, *Arctia fuliginosa* from Rannoch, including a specimen with black abdomen and hind wings.—Mr. H. B. Whitehouse, two melanic specimens and one intermediate form of *Liparis monacha* bred from dark Hull females; also *Sphinx pinastri* bred from Arlington (Suffolk) females.—Mr. L. W. Newman read a paper dealing with his experiences in breeding various melanic forms of Lepidoptera.—S. G. BELL, Hon. Sec.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The usual monthly meeting of this Society was held in the Royal Institution, Colquitt Street, Liverpool, on December 21st, 1906, Mr. W. Mansbridge, Vice-President, in the chair.—Mr. A. J. Wightman, of Reigate, was elected a member of the Society.—A paper was read by Mr. F. N. Pierce, F.E.S., entitled "Notes on the Structure of *Malacosoma hybrid schaufussi* (*M. castrensis* \times *M. neustria*)."
The paper was admirably

illustrated by microscope preparations of the insects named, as well as of *M. franconica*, shown upon the screen by the aid of the micro-lantern. The author pointed out that, unlike the usual mixture of male and female genitalia obtaining in the case of hybrids, the sexes of *schaufussi* possessed unmixed organs proper to the respective sexes. From a consideration of the details of the structure of the hybrid moths they are seen to combine the distinguishing features of each of the parent species, though perhaps leaning more toward *neustria*. The scales also showed modifications, being intermediate in form and size between those of the parents from the same part of the wing.—Mr. Fred. Birch, who shortly sails for Brazil upon a collecting expedition, gave a most interesting address upon his experiences in Trinidad when in quest of tropical Lepidoptera; his original observations upon the habits and peculiarities of the butterflies of the island were much appreciated by the members present.—The following exhibits were made, *viz.*, by Mr. Oulton Harrison: An album of photographs of Lepidoptera in their various stages, taken by Mr. Hugh Main, of London; also, on behalf of the Rev. T. B. Eddrup, of Horbury, melanic *Agrotis agathina* from the West Riding, *Boarmia repandata* from Horbury, and its variety *conversaria* from Barmouth.—The Honorary Secretary showed, on behalf of Mr. R. Hancock, of Birmingham, a number of photographs of Lepidoptera, and read a letter relating to the exhibit.—Mr. W. Mansbridge, a short series of *Triphaena comes* var. *curtisii* from Aberdeen, and a series of the chocolate form of *Hemerophila abruptaria* from the London area, together with examples of the type for comparison; also melanic specimens of *A. agathina* from Delamere for comparison with Mr. Eddrup's; they were seen to be more smoky in ground colour than the West Riding specimens, appearing quite dull beside them.—Mr. Oscar Whitaker exhibited lantern-slides of the exotic cockroaches *Blabera gigantea* and *B. marmorata* from the collection of Mr. E. J. B. Sopp.

The annual meeting of the Society was held in the Royal Institution, Liverpool, on January 17th, 1907, Mr. Richard Wilding, Vice-President, in the chair.—Lieut. the Hon. R. O. B. Bridgeman, R.N., of Salop, was elected a member of the Society.—The following office-bearers were elected for the ensuing year:—President, S. J. Capper, F.E.S.; Vice-Presidents, Dr. J. H. Bailey, M.B. (Port Erin), E. J. B. Sopp, F.R.Met.S., Prof. E. B. Poulton, M.A., D.Sc., F.E.S., J. R. Charnley, F.Z.S., F.E.S., Dr. H. H. Corbett (Doncaster), Wm. Mansbridge, F.E.S.; Treasurer, Dr. J. Cotton, F.E.S.; Secretaries, H. R. Sweeting, M.A., Wm. Mansbridge, W. D. Harrison; Editor, J. R. le B. Tomlin, M.A., F.E.S.; Librarian, F. N. Pierce, F.E.S.; Council, J. Kidson Taylor (Buxton), W. Webster, M.R.S.A.I., F. R. Dixon-Nuttall, F.R.M.S., Dr. P. F. Timne, M.A., M.B., the Rev. T. B. Eddrup, M.A. (Wakefield), C. E. Stott, R. Tait, Junr., Dr. P. Edwards, J. Collins (Oxford), R. Wilding, O. Whittaker, Dr. Wm. Bell, J.P.—After the formal business of the meeting, the retiring Vice-President, Prof. T. Hudson Beare, B.Sc., F.E.S., of Edinburgh, communicated his address to the Society. The Professor, after detailing the chief scientific achievements of entomologists during 1906, made a number of interesting and valuable suggestions for individual as well as collective furtherance of our studies, and instanced the remarkable work

us : ~ is Dr. Joy, Mr. H. St. J. K.
 us : ~ or least-known Coleoptera
 of : ~ to the author was pro-
 ab : ~ E. J. B. Sopp, F.R.Met.S.,
 in : ~ Society's Proceedings.—
 w : ~ members :—Dr. Cotton, a
 dv : ~ Witherslack: a series of
 B : ~ Lancashire; and a series of
 h : ~ H. R. Sweeting, a number of
 e : ~ specimens of the rare moth *Deile-*
 E : ~ *lina testacea*; *Macaria*
 C : ~ *camere*; and *Lycæna icarus*
 e : ~ F. N. Pierce, F.E.S., a box of
 s : ~ Lardison brought moths collected
 L : ~ at ivy-bloom—a series of
 v : ~ *Sciaiphila communana*, the last from
 ~ : ~ Sefton Park, Liverpool. Mr.
 ~ : ~ A. Thurnall, of Croydon; these
 ~ : ~ of attention.—The Honorary
 ~ : ~ try to be in a very satisfactory
 ~ : ~ to make full use of in the pre-
 ~ : ~ Society's work—H. R. SWEETING

~ : SOCIETY.—November 19th, 1906.—Mr.
 ~ : ~ in the chair.—Mr. L. Doucaster,
 ~ : ~ Mr. Hubert Langley, Narborough
 ~ : ~ members of the Society.—Mr. E. C.
 ~ : ~ Lepidoptera taken by himself at Brad-
 ~ : ~ The most interesting species was
 ~ : ~ occurred in hundreds; there were also
 ~ : ~ *Sciaiphila communana*, Rott., *Solidosoma ericetaria*,
 ~ : ~ Gose, &c.—Mr. G. T. Fountain showed
 ~ : ~ from Cornwall.—Mr. S. H. Kenrick
 ~ : ~ Erycinaeum Erycenidæ, and pointed out the
 ~ : ~ appearance between them and the western
 ~ : ~ showed various *Noctuæ* bred from dug
 ~ : ~ L., which species he said had emerged
 ~ : ~—Mr. W. E. Collinge showed living
 ~ : ~ parasites from larvae of *Agrotis segetum*, Schiff.,
 ~ : ~ *Agrotis ocellata*, L.—Mr. A. H. Martineau
 ~ : ~ from *Potentilla reptans* = *Xestophanes*
 ~ : ~ an abundance in Devonshire, the only county
 ~ : ~ at present.—Mr. Hubert Langley showed
 ~ : ~ from Leamington, where he had found it on
 ~ : ~ abundance. So numerous was it that, on
 ~ : ~ fifty-seven on one tree-trunk. He also
 ~ : ~ Schleuen, which he found commonly at
 ~ : ~ COLBRAN J. WAINWRIGHT, Hon. Sec.

RECENT LITERATURE.

1. *The Annals of Scottish Natural History*. Edinburgh. 1906.

Although treating of natural history in a very wide sense, no student of the British insects can safely leave this excellent periodical unexamined. This year the dipterist is the one most extensively catered for.

2. *Museum Gazette and Journal of Field-Study*. Conducted by JONATHAN HUTCHINSON, &c., Illustrated. Haslemere.

This monthly magazine contains readable popular articles on all sorts of out-of-door subjects. The list of books, &c., for sale at the museum gives an unfortunate trade appearance to what should, nevertheless, be a useful periodical to the not too advanced naturalist.

3. *The Science of Dry Fly Fishing*. By F. G. SHAW. London: Bradbury, Agnew & Co., Ltd. 1906.

A fly-fisher need not necessarily be an entomologist, although there is little doubt that a knowledge of entomology will make even a good fly-fisher a better one. In any case we have here clearly a good text-book, well got up and beautifully illustrated. If the entomologist would not go to it to study entomology, he should, at any rate, look at the illustrations of insects, by Horace Knight, in Plates xv. and xvi.

4. *First Report of the Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii*. Honolulu. 1905.

A long report of 170 pages, but apparently containing little of interest to the entomologist generally. A great part is confined to forestry.

5. *The Bombay Locust, Acridium succinctum* (Linn.), (from *Memoirs of the Department of Agriculture in India*). By H. MAXWELL-LEFROY. 112 pages, 18 plates. Calcutta. 1906.

A long and full account of the insect, its attack, and the mode of combating it.

6. *The Western Pine-destroying Bark Beetle, Dendroctonus brevicomis*, Lec. (*Some Insects injurious to Forests*). By J. L. WEBB. 14 pages, 2 plates, and 6 illustrations in text. Washington. 1906.

"Object of the paper to give available information on this insect and methods of combating it."

7. *Notes on Exotic Forficulids or Earwigs, with descriptions of New Species*. By J. A. G. REHN. Illustrated. 15 pages. Washington. 1905.

8. *Notes on South American Grasshoppers of the Sub-Family Acridinae (Acrididae), with descriptions of New Genera and Species*. By J. A. G. REHN. 21 pages. Washington. 1906.

9. *The Locustidae and Grylidae (Katydid and Crickets) collected by W. T. Foster in Paraguay*. By A. N. CAUDELL. 10 pages. Washington. 1906.

10. *Synoptic List of Paraguayan Acrididae, with descriptions of New Forms.* By L. BRUNER. 82 pages, 3 plates. Washington. 1906.

W. J. L.

Butterflies of Hongkong and South-East China. By J. C. KERSHAW, F.E.S., F.Z.S. Hongkong: Kelly & Walsh, Ltd. London Agent, R. H. Porter. 1906.

Of this work, which it is understood will be completed in about six parts, we have received the first three instalments. Part I., fourteen pages and two plates, deals with the Danainæ. Part II., eighteen pages and three plates, treats of the Satyrinæ, Morphinæ, and a portion of Nymphalinae. In Part III. the remainder of the Nymphalinae and the Erycinidæ are considered; there are twenty-eight pages and four plates in this section.

The plates, i.-vii., reproduced from coloured drawings in "colour-type," are well covered with figures. All the plates are on paper less in size than that upon which the text is printed; the latter is a folio, 10×15 inches, whereas the plate-paper is a quarto, $11\frac{1}{8} \times 9\frac{1}{8}$ inches. Two of the plates, each with a single figure, are not numbered, and appear to be "extras." Although the leaves bearing the plate explanations are not numbered, they seem to have been included in the enumeration of the pages.

A List of the Lepidoptera of Shepton Mallet and District, with Remarks as to Localities, &c. By W. A. BOGUE, F.E.S.

THE two hundred and forty-five species, chiefly collected by the author, mentioned in this list comprise thirty-two Rhopalocera, eighty-six Geometridæ, and eighty-three Noctuidæ.

WE have also received the following publications of the U.S. Department of Agriculture (Bureau of Entomology):—

Bulletin No. 59. *Proliferation as a Factor in the National Control of the Mexican Cotton Boll Weevil.* By W. E. HINDS, Ph.D. Pp. 45, plates i.-vi.

Bulletin No. 60. *Proceedings of the Eighteenth Annual Meeting of the Association of Economic Entomologists.* Pp. 1-206, plates i.-iii., and several illustrations in text.

Bulletin No. 62. *The San Jose or Chinese Scale.* By C. L. MARLATT. Pp. 1-89, plates i.-ix., and 12 text figures.

Technical Series, No. 12, Part I. *Catalogue of recently described Coccidae.* By J. G. SANDERS, M.A. Pp. 1-18.

Technical Series, No. 13. *A Revision of the Tyroglyphidae of the United States.* By NATHAN BANKES. Pp. 1-84, plates i.-vi.

Farmers' Bulletin, No. 264. *The Brown-tail Moth, and How to Control it.* By L. O. HOWARD. Pp. 1-22, and 10 text illustrations.

THE moth referred to is the European species *Euproctis (Porthesia) chryorrhæa*, L., which was accidentally introduced into New England some fifteen years ago. (See also Dr. Smith's remarks on this species and other Liparid moths, *Report of the Entomological Department of the New Jersey Agricultural College Experiment Station for 1905.*)

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[No. 526.

NOTES ON THE NOMENCLATURE OF SOME HYMENOPTERA.

By T. D. A. COCKERELL.

In the course of my work I have come across a number of names, currently in use for Hymenoptera, which appear to need rectification. A brief account of these is given herewith.

EUGLOSSIDÆ.

Eulema mussitans (Fabr.).

Apis mussitans, Fabr., 1787. This has been referred by all recent writers to *E. surinamensis*, based on *Apis surinamensis*, L., Syst. Nat. p. 579, No. 36. It is not, however, *A. surinamensis*, L., Syst. Nat. p. 575, No. 6, which is described as "A. atra, alis atro-cærulescentibus, abdominis petiolo obovato. Habitat in America, Rolander. Magna, facie Sphegis, sed lingua instructa." This latter is a wasp, doubtfully identical with *Zethus mexicanus* (L., 1767). Friese has described a variety from Venezuela, which will stand as *Eulema mussitans nigrifacies* (Friese).

ANTHOPHORIDÆ.

Anthophora atrocincta, Lep., 1841.

Apis plumipes, Fabricius, 1781; not Pallas, 1772.

South Africa (Dalla Torre wrongly gives the locality as India). I have specimens from Dr. Brauns.

Habropoda montana, Rad., 1882.

Dalla Torre referred this to *Podalirius*, and then changed the name to *P. radoszkowskii*, because of the prior *P. montanus* (Cresson). Bingham correctly refers the insect back to *Habropoda*, but retains Dalla Torre's specific name, which is quite unnecessary.

ENTOM.—MARCH, 1907.

Tetralonia phryne (Nurse), *T. pomona* (Nurse), *T. cassandra* (Nurse).

These North Indian species are described by Nurse in 1904 under *Eucera*, subg. *Macrocera*, with the remark that *Macrocera* has priority over *Tetralonia*. *Macrocera*, however, is a homonym, and in my opinion *Tetralonia* is a valid genus.

MEGACHILIDÆ.

Megachile mendozana, n. n.

Megachile cornuta, Smith, Deser. New Sp. Hym. 1879, p. 78; Ckll., Trans. Amer. Ent. Soc. 1905, p. 841 (Argentine); not of Latreille, Hist. Nat. Ins. 1805, p. 59.

ANDRENIDÆ.

Andrena radoszkowskyi, Schmiedeknecht, 1883.

Andrena fasciata, Radoszkowsky, 1876; not Fabricius, 1775; not Imhof, 1832. Caucasus.

Andrena ducis, n. n.

Andrena transcaspica, Radoszkowsky, 1893; not Radoszkowsky, 1886.

A. radoszkowskii, Dalla Torre, Cat. Hym. x. 149 (1896); not Schmied. 1883. Central Asia.

MUTILLIDÆ.

Mutilla cameronella, n. n.

Mutilla confusa, Cameron, Biol. Cent.-Amer. 1894, p. 115 (Panama); not of Lepel. 1845.

Mutilla wallacei, n. n.

Mutilla nigra, Smith, Journ. Proc. Linn. Soc., Zool., 1858, p. 151 (Aru Is.); not of Rossi, 1792. See also E. André, Ann. Mus. Civ. Genova, 1896, p. 78 (New Guinea).

Mutilla saharæ, n. n.

Mutilla fasciata, Klug, Symb. Phys. 1829 (Sahara); not of Olivier, 1811.

M. (Stenomutilla) argentata var. *aucta*, Lep., cannot take the earlier name *bifasciata*, Klug, 1829, because of the still earlier *bifasciata*, Swederus, 1787 (= *occidentalis*, L.). However, the name *rondanii*, Spinola, is two years older than *aucta*.

SCOLIIDÆ.

Compsomeris druryi, n. n.

Vespa maculata, Drury, 1773; not of Linné, 1763.

Scolia quadrimaculata, Fabricius, 1804; not of Fabricius, 1775. Jamaica.

LARRIDÆ.

Dinetus pictus (Fabr.).*Sphex guttata*, Fabricius, 1793; not of Gmelin, 1790.The name *D. pictus*, commonly used by authors, is wrongly made to give way to *D. guttatus* in Dalla Torre's catalogue.

CRABRONIDÆ.

Crabro dives schenckii, n. n.*Crabro pictus*, Schenck, Jahrb. Ver. Naturk. Nassau, 1857; not of Fabricius, 1793 (= *Dinetus*).*Solenius rufipes* (Lep.).*Crabro rufipes* (Lep.) Smith, was described under *Ceratocolus*. If it is left in *Crabro* it must take the name *C. excavatus*, Fox, because of *C. rufipes*, Fabr., 1787 (? = *Cerceris tuberculata*); but if we follow Ashmead in placing it in *Solenius*, the original name remains.

ORTHOPTERA IN 1905 AND 1906.

By W. J. LUCAS, B.A., F.E.S.

NEITHER in 1905 nor in 1906 did anything of special interest with regard to our Orthoptera come under my ken; still, as the sum of our knowledge is made up of details, it will not be out of place to put on record even the trivialities that have been noted, seeing especially that it is in consequence of such small details not being recorded that our knowledge of this order is so incomplete. There are, in fact, some counties in England (Shropshire, for instance) of whose orthopterous fauna we seem to have absolutely no records whatever, and yet surely there are some naturalists who could tell us at least if the common earwig and the kitchen cockroach exist there, for we cannot be said to know that they do.

1905. On February 25th male specimens of *Forficula auricularia* were found inside dead and hollow stems of deadly nightshade (*Atropa belladonna*) on the Roman Road, near Leatherhead. Specimens found hibernating are usually females, but this find seems to indicate that the males hibernate also. Of this species one or two aberrations were met with. A dark female was taken by Mr. F. M. Carr in the New Forest in April. Mr. R. A. R. Priske kindly gave me a male with aberrant forceps (the left branch being normal, but the right as large as in var. *forcipata*), which he took at Deal in September. Amongst a number of earwigs found in a garden in the town of Warwick (September 7th-11th) was a male with very abnormal forceps

(= cerci). They are long and slender, but the chief peculiarity is that they are soldered together at the base, while the distal part seems to be jointed to the basal, which, if this is the meaning of the peculiarity, is of interest in connection with the fact that the cerci of other Orthoptera are regularly jointed. Commander Walker has succeeded in adding somewhat to our knowledge of the distribution of *Forficula lesnei*. He was kind enough to give me a female which he took at Queendown Warren, near Chatham, Kent, probably in 1899; while he tells me that he took a female in moss at Streatley, Berks, on the 21st October, 1905. This second specimen was no doubt hibernating.

As regards the short-horned grasshoppers (Acridians), the little hibernating species, *Tettix bipunctatus*, was found in the New Forest on April 1st. Of the rest, *Gomphocerus maculatus* was the first that I met with mature, the locality being near Oxshott, Surrey, and the date July 17th. On the downs near Clandon, Surrey, grasshoppers were seldom mature on July 20th. *Mecostethus grossus* still continues to show itself in new localities in the New Forest; in fact, one seldom examines in August one of the numerous bogs without meeting with this large and handsome species. Its habits are most interesting to watch in freedom, while, if fed on grass and not kept in too dry a place, it will live for some time and its habits may be watched, in captivity. *Stenobothrus rufipes*, of both sexes, was found in a ride in Perry Wood, in the New Forest, on August 9th. This species in captivity also feeds readily off grass, eating along the margin of the leaf. One was kept alive thus for six or seven weeks, and it only succumbed about October 14th. Of *S. bicolor*, both sexes were taken at Hurst Castle on August 7th. The much less common species, *S. elegans*, was met with twice in the New Forest. On August 8th a female was taken near Highland Water, just beyond Queen's Mead, and it was found much more commonly at Matley Bog on August 23rd. No other grasshoppers seemed to be present with it at the latter locality, where more females were noticed than males. Many of the former were green, but some were of a rather rich brown colour; the streak on each side, both on wings and pronotum, is often very conspicuous in this sex, in which also the elytra do not reach to the extremity of the abdomen. The males are more active than the females. Mr. A. H. Hamm took the species at the Deal sand-hills, where the specimens were brownish in colour, harmonising with the soil, as the green ones did with the grass in the New Forest. *S. parallelus* was taken near Warwick on September 10th, and on Arbrook Common, Surrey, on October 1st. *Gomphocerus maculatus* was noted by myself at Need's Ore, Hants, on August 10th; while Colonel Yerbury gave me a specimen taken at Nairn, in Scotland, on the 3rd. The

peculiar little *Tettix bipunctatus* was met with at Horsley on May 27th, and at Bookham Common on May 31st; while Colonel Yerbury gave me Scotch specimens taken at Nairn on May 18th and June 6th, at Brodie on June 5th, and at Nethy Bridge on June 15th.

Of the long-horned grasshoppers (Locustids), I have records of but three species. Mr. B. G. Cooper gave me a female specimen of *Locusta viridissima*, which he took on the downs near Swanage, well "protected" on a furze-bush. Mr. H. M. Edelsten sent me specimens of *Platycleis grisea*, taken at Dartmouth at sugar, which they were eating. He says "one female was laying eggs in one of the posts; it had its ovipositor thrust deeply into a chink in the wood. What curious black cigar-shaped things the eggs are! One female had the top of its head and the plate on the thorax quite red. Females were more plentiful than males." Two females of *P. brachyptera* were taken near Oxshott on September 30th, and kept in captivity. About a week later one partly devoured the other. Whether the victim became moribund, or whether it was forcibly overcome by the other, I cannot say; but, as was clear from movements of its jaws, it was not lifeless while the other was feeding upon it. Grass had been supplied to them, but I cannot say that they fed on it, and it soon got dry each time. *L. viridissima* has been credited with similar tendencies, and possibly few of our Orthoptera are entirely without carnivorous, if not cannibalistic, habits.

1906. On January 14th, in a damp rotting tree-stump on Esher Common, a male *Forficula auricularia* was found hibernating, thus confirming my observation of the hibernation of this sex in 1905. On January 28th—also on Esher Common—I found beneath some Scotch firs, about two or three inches under ground, a female of this species, with her eggs, near the rhizome of a bracken-fern. They were placed in a glass-topped box with a little moss and soil. Later, the mother was seen carefully hunting over the soil, and, on finding an egg, picking it up and carrying it away in her jaws to the shelter of the moss out of sight. On January 31st there was a little heap of sixteen eggs. Though they are fairly large, this seems a small number; but perhaps some were lost when I inadvertently brought them to light in the woods. The egg is just over a millimeter long, and just under one broad; it is yellowish in colour, with perhaps a faint tinge of green, and appears to have no markings. On February 2nd, and on the morning of February 3rd, the mother was apparently "brooding over her eggs," but after that they seemed to be scattered and neglected. On February 7th they were in the same state, and on examination with a lens I found several, at least, were bent in on one side; I concluded that they were dead, and that the mother knew the fact. This date

(January 28th) seems early for eggs; and, indeed, on April 25th, in the New Forest, I found, in a piece of a decaying branch on the ground, two females of the same species, together with some eggs and some very young nymphs. *F. auricularia* was noticed at sugar in the New Forest on August 27th and in Kew Gardens on September 22nd. On November 24th Commander Walker took a male *F. lesnei* in a tuft of grass at Headington Wick, near Oxford. This capture is of special interest as pointing to the fact that of this species also the male hibernates as well as the female. The branches of the forceps were rather more parallel than usual. The same energetic naturalist sent me a number of specimens of *Anisolabis annulipes* from the "sack-heap" on the premises of the Sheppeney Glue and Chemical Works, Queenborough. He says they were more common than he had seen them before, but *Apterygida arachidis* was quite rare.

Ectobia panzeri, our smallest cockroach, was found in the New Forest by Blackwater Stream, near Queen's Bower, on August 10th; near Beaulieu River, on August 18th; at Holmsley (two dark ones), on August 21st; and near Ober Water Stream, not far from Brockenhurst (one dark specimen), on August 31st. Neither *E. lapponica* nor *E. livida*, though specially sought for, could be found.

This season a mature *Gomphocerus maculatus* was found on Esher Common as early as June 23rd, while a *Stenobothrus viridulus* was taken mature in the same place on July 3rd. The latter species I was pleased to receive from Mr. K. J. Morton, taken at Carlisle, in Scotland, on August 6th; and at Emyvale, Co. Monaghan, in Ireland, July 20th-30th. In the New Forest, on September 2nd, I attempted to catch what I took to be a pair of the large hornet-fly (*Asilus crabroniformis*). One flew away, however, as I approached, and the other fell to the ground. What was my surprise to find that the latter was a male *Mecostethus grossus*, dead, or apparently so! The prey was as large as the captor. *Stenobothrus bicolor* was noted or received from several localities—near Lulworth Cove, August 28th; at Kingsley, Bucks, September 5th; on the White Horse Hills, Berks, near the "Blowing-stone" and Letcombe Bassett, September 8th; near Newland's Corner, Surrey, September 11th; Great Malvern; Kew Gardens; the Royal Horticultural Gardens at Wisley, Surrey; and at Chiswick (A. Sich), on October 8th, in the road near a meadow. The last record is of interest owing to the approach of London in that direction. On August 21st, near Holmsley Station, in the New Forest, *S. elegans* was met with in large numbers near boggy ground. Several localities for the common *S. parallelus* were noticed—near the Itchin at Eastleigh, August 14th; near Lulworth Cove, August 28th; near Ilmer, and at Kingsley, Bucks, September 5th; on Chilswell Hill, Berks, September 7th; near the "Blowing-stone" and Let-

combe Bassett, September 8th; near Newland's Corner, September 11th; Beachy Head, September 20th; and Kew Gardens, September 22nd. *Tettix bipunctatus* was found near the Itchin at Eastleigh on August 14th, and was received from the Royal Horticultural Society's Gardens at Wisley.

To turn now to the Locustids. *Leptophyes punctatissima* and *Meconema varium* were received from Hanwell (W. M. Webb), having been taken on September 4th, and the latter was also received from the Royal Horticultural Society's Gardens at Wisley. *M. varium* came to sugar in the New Forest on August 23rd and 27th, and in Kew Gardens on September 22nd. Mr. H. M. Edelsten sent me specimens of the local *Xiphidium dorsale*, which he found very common on reeds at night in the Norfolk Broads on July 28th and 29th. A specimen of *Thamnotrizon cinereus* came to sugar in the New Forest on August 27th. The last grasshoppers seen by me were a female *Platycleis brachyptera*, near Oxshott, Surrey, on October 6th, and another female of the same species on Esher Common, in the same district, on October 14th.

Kingston-on-Thames: February, 1907.

SCOTCH LEPIDOPTERA IN 1906.

By A. E. GIBBS, F.L.S.

DURING the greater part of the past season, Mr. L. G. Esson was collecting for me in Perthshire, Aberdeenshire, or Elgin, and a summary of the results achieved may be worth putting on record. Work began on the 20th of March, when Mr. Esson, who had reached Struan the previous night, arrived at Rannoch to search for *Petasia nubeculosa*. Six hours' work in the far-famed Black Wood yielded only half a dozen specimens of *Semioscopus avellanella*, an insect which was subsequently taken in large numbers. The next day's exertions, however, were attended by better luck, for one *Asphalia flavicornis* and two "sprawlers"—one of each sex—rewarded his careful search of the birch-trunks. The *nubeculosa* were freshly emerged specimens, but unfortunately the male bled rather badly on its journey to England, which slightly spoiled it for cabinet purposes. On the 22nd another was taken, and between that date and the end of the month seven others were secured. Only twice were two specimens found on the same day. Two small batches of eggs were obtained, numbering twelve and thirteen respectively, but, as one of my boxes got smashed in the post, about half of them were lost. During my absence from home

Mr. P. J. Barraud kindly took charge of them for me, and nine young larvæ resulted. These were fed up on birch, sleeved out in my garden, and left pretty much to their own devices. Six of them successfully pupated at the end of June in some blocks of peat placed in the bottom of the sleeve, and I suppose it is possible I may have to wait four or five years before the moths emerge. My short series of ten "sprawlers" exhibits considerable variation in the intensity of colouring, one male being exceptionally light, while in the ground colour of another specimen (a female) there is a suffusion of reddish brown. The *A. flavigornis*, of which a number were taken in March and April, are of the usual Rannoch form (var. *scotica* of Staudinger, I think), many of them handsome, boldly-marked insects with large silver-grey patches on the costa. They vary in the number and intensity of the transverse markings, and lack the greenish-grey appearance of our southern forms. Sugaring during these early months of the year did not yield very good results, only a few hybernated specimens of *Cerastes vaccinii*, *Scopelosoma satellitia* and *Calocampa exoleta* appearing. The weather was cold and discouraging, and at the end of the month of March I withdrew my collector for a time; but about the middle of April I sent him back to Perthshire, with the object, chiefly, of getting a series of *Nyssia lapponia*, and this proved to be one of the most successful quests of a bad year, notwithstanding the continual rain and sleet which prevailed. Mr. Esson describes it as rough work searching for *N. lapponia* amid bogs and boulders, the long wet vegetation proving very destructive to shoe-leather. The insects are to be discovered settled on the branches of heather and bog-myrtle, but may also be found on posts and fences. After a fall of snow the apterous females resemble little snowballs, and are not easily seen. Several travelled to Hertfordshire safely in chip-boxes, and they deposited eggs freely in the folds of crumpled pieces of muslin; between the layers of fragments of corrugated packing-board with which I supplied them; in the crevices of chip-boxes; or, indeed, in any cranny into which they could insect their long ovipositors. This is not an easy species to rear. I distributed a good many ova, but it is to be feared that few pupæ have resulted, and it remains to be seen from how many of these moths will emerge safely. A few varieties of *Tæniocampa gothica* and *T. instabilis* were taken during April and May. *Lobophora carpinata* was abundant, and in the latter month a few nice varieties of *Cidaria suffumata* were secured. Bad weather continued to interfere with collecting, but a very satisfactory lot of *Anarta cordigera* made prospects appear more cheerful. On May 19th, in company with Mr. T. Salvage—who, I believe, was working at Rannoch for a syndicate—Mr. Esson found *A. cordigera* flying "all over the hills," in a gale of wind, which made them difficult to catch. Returning at

five o'clock in the afternoon, to search for them at rest, they were successful in obtaining rather a long series. Mr. Esson tells me that his experience shows that they do not habitually settle on the ground, as has been stated, but on stones about the size of a man's head; and the way to secure them is to stalk them with the sun in your face, a swift down stroke with the net being necessary. He further expresses the opinion that *cordigera* will not pair unless the sun is shining. *Fidonia carbonaria* was not very plentiful in 1906; a month's hard work only resulted in the capture of about a score of specimens. The weather continued to be most disheartening, and at the end of May I withdrew Mr. Esson from Rannoch; but in a day or two it cleared up and appeared more promising, so we decided to try again. He went back, and on June 9th sent me the first lot of *Anarta melanopa*, among them being a curious dwarf form. On account of the storms it was very difficult to obtain this insect in good condition, most of those sent to me being more or less "bald-headed." Two specimens of *Crymodes exulis*, of the *assimilis* form, were taken at sugar on the north side of the loch.

We were anxious to obtain pupæ of *Pachnobia alpina*, but, although a careful search was made among the moss in the usual localities, it unfortunately proved futile, though I believe Mr. Salvage met with better success. Sugar during June and July produced a good series of *Hadena rectilinea*, *H. contigua*, *H. adusta*, *Noctua brunnea*, *N. festiva* (rather varied), *Xylophasia rurea* (some pretty silvery forms), six *Aplecta occulta*, four *A. herbida*, and twelve *A. tincta*. An interesting lot of *Cymatophora duplaris* were secured, and other things worth mention include *Nemeophila* var. *hospita*, *Acronycta myricæ*, *A. ligustri*, *A. menyanthidis*, *Stilbia anomala*, and *Hadena glauca*. Two specimens of *Plusia bractea* were taken on August 1st at honeysuckle-bloom. Among the Geometers, the best things were *Larentia flavicinctata*, of which eleven were obtained on Schiehallion on a wet day at the beginning of August. Some interesting forms of *Cidaria corylata* came from Corrie Wood, where also the Scotch form of *Drepana falcataria*, with white ground colour, was found sparingly. Of *Emmelesia ericetata* and *E. blandiata*, long but not very variable series were sent, and other Geometers in the collection included *E. alchemillata*, *E. albulata*, *Melanthis ocellata*, *Melanippe tristata*, *M. sociata*, *Coremia munitata*, *Cidaria miata*, *immanata* (some striking forms), *Larentia cæsiata*, *Zonosoma pendularia*, &c. *Scopula alpinalis* was abundant on the mountains and in fine condition.

During the greater part of August, Mr. Esson worked in the neighbourhood of Aberdeen, whence he sent me, among other things, *Mamestra furva*, *Noctua sobrina*, *Agrotis lucernea*, *Orthosia suspecta*, *Calocampa solidaginis*, and other insects, for which this locality is famous. On the 27th of that month he went to Forres,

but bad weather again interfered with his work. Here the bag included two pleasing varieties of *Triphæna orbona*, four *Aporophyla nigra*, two *Cosmia paleacea*, and two *Noctua depuncta*, a species which was practically over, the specimens being much worn.

Kitchener's Meads, St. Albans.

“CURRENT CRITICISM.”

By G. W. KIRKALDY.

I CANNOT accept Mr. Distant's explanation (Entom. xl. 2) of the mistake he has made in the synonymy of *Cicadetta annulata* and *hageni*. Mr. Distant (on p. 166 of the ‘ Catalogue of Cicadidæ’) first positively gives Hagen's *annulata* as a synonym of Brullé's, then (on p. 168) cites it as a supposed separate species. If he had intended to mean that Hagen's species was composite, he would, as elsewhere in the Catalogue, have written “(part)” after each citation. Fieber does not give, as a synonym of *hageni*, “part of Hagen's species,” but the *whole*, and the two forms are still regarded as distinct by the best palæarctic authority, *viz.* Dr. Puton. The fact is that Mr. Distant, by mistake, inadvertently cited “*Cicada annulata*, Hagen,” as a synonym of *C. annulata*, Brullé; and on p. 166 of the Catalogue the entire reference to Hagen under “*annulata*” should be deleted. I was not carping at what is really a trivial error, but simply pointing it out for adjustment.

Mr. Distant has misunderstood my remarks on Amyot's mononymics. It is absurd to suppose that I was not aware that Stål and Karsch adopted them. I did not say Amyot's mononymics have no place in the literature of binomial nomenclature, but that they “have no place in binomial nomenclature,” *i. e.* they cannot be justly used therein. Amyot founded his system expressly to supplant that of Linnæus, and anyone who will read Amyot's preface, and study the application of the names in the body of the work, will, I am sure, at once rule them out of court for use in binomial nomenclature.

The remark that accuracy of dates seems to be a minor matter with Mr. Distant was an expression of my opinion, founded on solid facts. It will be necessary only to refer to one of Mr. Distant's most recent publications, *viz.* the ‘Fauna of British India’—*Rhynchota*, vols. i.-iii. (1903-6), and pick out citations at random:—

Leptocorus, Hahn—vol. i. p. 418—(wrongly cited as a synonym of *Serinetha*, which is of later date) was founded 1833, not 1831; many of Hahn and Schäffer's genera in the ‘Wanzen-

artigen Insecten' are wrongly dated by Mr. Distant, often by three or four years.

Metacanthus—vol. i. 422—was erected by Fieber, Eur. Hem. 55 (1860), not 213 (1861), and so with most of Fieber's genera cited from this work.

Nabis—vol. ii. 399—was founded 1802, not 1807.

"*Nabis viridulus*, Spin.—ii. 402—was proposed 1837, not 1840, and this applies to other citations of Spinola's 'Essai.'

"*Aphana pulchella*, Guér."—iii. 203. The text of the 'Coquille' was published in 1838, not 1830.

"*Aphæna variegata*"—iii. 204—should be dated 1833, not 1834.

Polydictya, Guér.—iii. 215. The "texte" of the Icon. Règne Anim. was not published before 1844, probably not till 1845. Mr. Distant cites 1830—4!

The correct dates of these have all been published in the 'Entomologist,' some of them many years ago. I do not expect Mr. Distant to accept without confirmation my notes on dates and synonymy, but if he chooses to disregard them without examination he cannot claim exemption from criticism.

With regard to the classification of the Miridæ (or Capsidæ), it is a pity that Mr. Distant neglected to read the papers he cites.

I did not, as Mr. Distant affirms, propose a new classification, but distinctly stated (Trans. Amer. Ent. Soc. xxxii. p. 117) that the object of my list was simply to enumerate the genera, genotypes, &c., and that it should be considered as a bibliographical contribution. I followed the latest Reuterian system known to me, adding the Hypselocæcini, Fulviini, and Clivinemini, founded by Reuter himself, together with seven monotypic tribes whose position was very doubtful. This, according to Mr. Distant, was my new classification! It may be added that—like Reuter and all those, in fact, who have studied the Miridæ—it was the very numerous and very insufficiently characterized genera of Mr. Distant that rendered fuller elaboration impossible.

It was some time after the "list" had passed the final proof—and, indeed, after partial issue as "published"**—that I received Dr. Reuter's classification. I at once studied it, and have come to the conclusion that it is a remarkable piece of work, and probably represents the real classification of known forms very closely, although I recognize that many of the characters used are very subtle, and render the study of this difficult group even harder. Of the fifty-six "addenda and emendanda" made in the 'Canadian Entomologist' (and, through a misunderstanding, also issued in my Separata of the "list," as pp. 156 a—156 b, though I do not think they have been actually published),

* The earlier pages are dated "March, 1906," but I cannot accept this as "publication."

a considerable proportion are minor typographical errors, unfortunately inevitable in papers consisting mostly of names and numbers. Most of the others are inserted to bring the "list" into line, as far as possible, with Reuter's work.*

Regarding *Angerianus*, Mr. Distant is in error; if he will refer to the 'Canadian Entomologist,' p. 374, he will see that I have deleted it from the list of unrecognized genera. Those who have had occasion to wrestle with Mr. Distant's genera will not wonder that I have slipped up occasionally.

I could write a good deal more on this subject, but desire to keep strictly to Mr. Distant's note. Those who are interested in the matter can refer to Reuter's paper ("Hemipterologische Spekulationen, I. Die Klassification der Capsiden," in 'Festschrift für Palmen,' no. 1, pp. 1-58 (dated 1905)).

DESCRIPTION OF A NEW SPECIES OF TINGIDIDÆ FROM HONOLULU.

BY W. L. DISTANT.

I RECENTLY received four specimens of a Tingid from Mr. Jacob Kotinsky, Assistant Entomologist to the Board of Commissioners of Agriculture and Forestry, Honolulu, with a request that I would identify the species. It had been determined by Mr. Kirkaldy as *Teleonemia bifasciata*, Champ., a species described from Central America; but from this it is quite distinct — by the markings of the elytra, the less prominently curved outer discal carinations of the pronotum, and the shorter apical joint to the antennæ. Under Champion's name it therefore appears in the Entomological Report for 1905 of the Territory of Hawaii. A figure is also given of the species, but in printing the same the dark fasciæ to the elytra have not been reproduced. Mr. Kotinsky states in the above-mentioned Report that it is an introduced insect, and that it "has inflicted terrible injury upon lantana."

The following is a description of this Tingid:—

Teleonemia lantanæ, sp. n.

Head, pronotum, antennæ, and body beneath dull fuscous; elytra brownish ochraceous, the discoidal area with two longitudinal piceous or black fasciæ, the innermost broadest and curved, the outermost more slender, straighter, and broken; sutural area with an undulating, oblique, central fascia, and an outer submarginal narrower and more broken fascia, piceous or black; femora fuscous, the tibiæ pale ochra-

* I have no doubt there are other errors of synonymy, &c., yet to be adjusted, and will be obliged to my colleagues for advice of the same.

ceous, with their apices and bases narrowly piceous, tarsi piceous; antennæ moderately stout, first and second joints about equal in length, fourth about as long as first and second united; pronotum prominently palely tricarinate, the lateral margins also carinate; of the three discal carinations, the outermost are only slightly curved, and a little inwardly turned towards base, the interspaces rugulose and finely punctate; elytra long, constricted behind the middle, rounded at apex; costal area with small, distinct, subhyaline, creamy-white areolets, their dividing lines fuscous; sutural area with an apical cluster of creamy-white areolets. Long. $3\frac{1}{2}$ to 4 millim.

Hab. Honolulu, Oahu (J. Kotinsky).

BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES
ON THE RHYNCHOTA.

By G. W. KIRKALDY.

IN the 'Entomologist' for December (p. 274), Mr. Distant comments upon certain hemipterous genera recently discussed nomenclatorially by me.

The review in 'Nature' of July 5th (lxxiv. p. 220) was the first intimation I received that the third volume of Mr. Distant's work on Indian Hemiptera had been published. The sixth of my bibliographical notes (Entom. 1906, pp. 247-9) was sent away before that, and as, in the 'Entomologist' for January, 1906 (p. 8), Mr. Distant had proposed names for certain preoccupied genera (in the Fulgoroidea) erected by Melichar in 1903, I naturally concluded that the English author had overlooked the preoccupation of "Kirbya," about which I had, indeed, written to Melichar in 1904. As it was, I wrote to the Editor, hoping to cancel it, but was too late. My synonymic note on *Coanaco* was also despatched before Mr. Distant's correction was published. These matters are, of course, of trivial importance, and, indeed, inevitable where two or more workers are traversing parts of the same ground.

The discarding of *Opinus* (even if possible, which I do not admit) would not render *Sminthocoris* valid, as *Tapeinus* would still be available.

I was quite aware of the existence of *Penthicodes*, which is a strict synonym of *Aphæna*. It was not founded for a special type, but expressly to replace the preoccupied *Penthicus*, which also was expressly erected to replace *Aphæna*, which was supposed to be preoccupied by *Aphanus*. The types of *Aphæna*, *Penthicus*, and *Penthicodes* are therefore one and the same, as indicated already.

ON SOME NEW CENTRAL AMERICAN VESPIDÆ.

By P. CAMERON.

ZETHOIDES, Cam., non Fox.

The name of this genus I changed into *Plesiozethus* in the 'Entomologist,' 1904, p. 269. Mr. Albert Schulz, not being aware of this, has proposed for it, in his laborious work, 'Spolia Hymenopterologica,' p. 213, 1906, the name of *Metazethoides*, which is, of course, useless.

Zethus (Didymogastra) lamellicollis, sp. nov.

Black, densely covered with fulvous pubescence; the clypeus, mandibles, except the apex and lower edge, under side of antennal scape, two small spots over the antennæ, a line behind the raised keel of pronotum, a small spot on the sides of scutellum, two lines on centre of post-scutellum, two longish pyriform marks (the narrowed end above) on the metanotum, a broad line on the sides of apex of abdominal petiole, with an oblique incision on the apex above and continued as a broader mark, narrowed on the inner side to near the middle of the segment above, and lines on the apices of the second to fifth segments, and a curved spot (the narrowed end at the base) on the apex of the petiole of second segment, bright lemon-yellow; the apical half of anterior femora, the middle in front, the apex of the hinder below, and the tibiae except behind of a paler yellow colour. Flagellum of antennæ orange-yellow below towards the apex. Wings hyaline, suffused with fuscous, the nervures and stigma black. ♂. Total length, 17 mm.

North Mexico.

Antennæ with a stout hook, narrowed towards the apex. Clypeus wider than long, its apex black, and bearing two short, black, widely separated teeth; the punctuation is distinct, but not very strong or close. Mandibles with three teeth, the basal two shorter and blunter than the apical. Front and vertex closely, strongly punctured; the temples broad, roundly narrowed, the occiput sharply keeled. Ocelli in an equilateral triangle, the latter separated from each other by the same distance they are from the eyes. Base of thorax raised into a transverse plate, which forms a furrow with the part behind, and is continued along the pronotum to near the tegulae, this lateral plate becoming shorter towards the apex. Mesonotum strongly, closely punctured, more closely on the basal than on the apical half; the former has a keel down the middle. Scutellum more shining and less pilose than the mesonotum; its punctures are more widely separated; it is not raised above the mesonotum. Post-scutellum rounded, broadly narrowed towards the apex; strongly punctured and covered with long hair. Metanotum with a rather steep slope, stoutly, obliquely striated. Propleurae smooth, the mesopleurae rather strongly punctured; the metapleuræ opaque, obscurely striated. Abdominal petiole smooth, shining, as long as the thorax, the basal third narrowed, the rest forming an elongated oval, depressed above at the apex; the

second segment with a narrow, cylindrical petiole, fully half the length of the rest, which forms a triangle, transverse at the apex, where there is a row of large punctures; the second margin is strongly reflexed; the apical half of the segment sparsely, weakly punctured, the following three segments are more coarsely and closely punctured. Tegulae black, yellow at base and apex.

Comes nearest apparently to *Z. chicotencatl*, Sauss., the male of which is unknown. It belongs to Saussure's Section B. of *Didymogastra*, which contains only South American species up till now.

Zethus (Didymogastra) claripennis, sp. nov.

Black, densely covered with a grey pile; a broad band on the apex of the clypeus (almost the apical third), a line on apex of pronotum, two squarish spots on apical half of scutellum, two large marks on apex of metanotum, straight on inner side, rounded and narrowed on outer side, a line on the apex of first abdominal segment above, a broader, more irregular mark on the apical third of the sides, its base narrowed, a line on the apical two-thirds of the base of the narrowed part of the second segment, and a line round the apex of the latter, bright lemon-yellow. Apical joints of antennæ pale orange below. Wings hyaline, iridescent, the nervures and stigma black. ♂. Total length, 14 mm.

North Mexico.

Antennæ ending in a thickened spiral. Clypeus not much wider than long, densely pilose, weakly, sparsely punctured, the punctures hid by the dense white pile; the apex with a short blunt tooth on either side of the centre. Front and vertex rugosely punctured; the ocelli almost in a curve, the hinder separated from each other by about the same distance they are from the eyes. Mandibles ending in two teeth, the apical much larger than the basal. Mesonotum closely, regularly, rather strongly punctured, without keels or furrows. Scutellums more shining and less closely punctured, the apex of post-scutellum broad. Metanotum obliquely sloped, depressed in the middle, irregularly, transversely striated. Abdominal petiole longish pyriform, two-thirds of the length of the thorax, not much narrowed at the base, the top weakly, the sides more strongly punctured. The narrowed base of the second segment is one-fourth of the length of the rest, which forms a triangle, not much longer than it is wide at the apex, which is flat, weakly punctured; the second border broad, reflexed. The thorax is not quite twice longer than wide, almost transverse at the base, where there is a reflexed margin; the apex becomes gradually narrowed from the base towards the apex.

Zethus (Didymogastra) fulvo-hirtus, sp. nov.

Black; the top of the head and of the thorax densely covered with fulvous pubescence; the pubescence on the rest of the body not so dense, and paler; the first abdominal segment almost bare, the second covered with a pale fulvous pile; the under side of the antennal scape, the raised base of thorax, a small spot on the sides of scutellum, an interrupted line on the post-scutellum, two longish broad marks on the metanotum, straight on the inner side, rounded and narrowed on the

outer, a bifid mark, broad and rounded on the infer, longer and narrower on the outer sides on the apex of the first abdominal segment, and narrow lines all round the apices of the second to fifth abdominal segments, bright lemon-yellow. Flagellum at the base and apex below dark brown. Wings hyaline, very iridescent, narrowly smoky along the fore margin. ♀. Total length, 16 mm.

Nicaragua.

The narrowed basal part of the abdominal petiole is about one-fourth of the whole; it becomes gradually thickened above and laterally; the apex is depressed above; the narrowed base of the second is a little more than one-fourth of the whole. The first and second are impunctate, except the apex of the latter, where there is a punctured belt. The third, fourth, and fifth segments are strongly punctured. The pronotal crest is conspicuous, and extends almost half-way down the sides. Mesonotum and scutellums smooth, shining, except the part at base of scutellum, which is strongly striated. Centre of metanotum strongly striated, the top lateral angles as strongly, obliquely striated, the striae twisted; there is a stout keel down its centre. Mesopleurae strongly, closely punctured, the pro- and metapleurae smooth. Front and vertex rather strongly and closely punctured; the ocelli in a triangle, the hinder separated from each other by a greater distance than they are from the eyes; they are placed opposite the end of the eyes. Clypeus rounded, its apex broad, clearly separated, transverse, smooth, shining, the shining part broader in the middle. Temples roundly, obliquely narrowed. There is a stout keel down the basal half of the mesonotum, it being bordered by a shorter, thinner one on the base. The four anterior tibiae are yellow in front, and there is a narrow yellow line on the outer edge of the hinder; the apex of fore femora narrowly, of the middle more broadly, yellow. Mandibles with two broad apical teeth. Scutellum flat. The second lamina of second abdominal segment is narrow, distinctly reflexed. The post-scutellum becomes gradually narrowed towards the apex.

Allied to *Z. chicotencatl*, Sauss., and *tubulifer*, Sauss., from Mexico.

(To be continued.)

NOTES AND OBSERVATIONS.

THE ENTOMOLOGICAL CLUB.—A meeting of this old-established Club was held on January 22nd last, in the Entomological Salon, Holborn Restaurant. Mr. G. H. Verrall in the chair. Members and invited guests began to assemble soon after 6.30 p.m., and by 8.30 p.m.—at which time supper was served—there were over seventy present. Supper being over, Mr. Verrall first proposed the toast of "The King," and afterwards that of "The Entomological Club." In moving the latter, he adverted to the fact that having been elected a member of the Club in 1887, it was the twenty-first occasion on which it had been his privilege and pleasure to occupy the chair. He also remarked that although membership of the Club was limited to eight, still they could elect honorary members, and that these would be eligible in their turn to fill up such vacancies as might occur on the

roll. Touching on the subject of the property of the Club in the shape of its collections of insects, he stated that he had lately seen these, and noted that the specimens therein were in good order, and well cared for by Mr. Lowne, the curator, in whose possession they still remained. The delightful violin solos by Mr. Jacoby greatly augmented the pleasure of the evening.

LAPHYGMA EXIGUA.—On August 25th last I took a specimen of this insect on a gas-lamp near Poole, Dorset, and two days later, when out with Mr. W. G. Hooker, of Bournemouth, we captured a second, on a lamp at the same place. As the first specimen was a female I kept it alive, and on the night of August 26th it laid about a hundred and twenty-five ova in a chip-box. I kept about seventy-five of these, and they emerged on August 31st. The young larvæ fed up easily on dock, and commenced to pupate at the end of September, the perfect insects emerging at the end of October and beginning of November, with the aid of a little artificial heat. I bred forty-four perfect specimens, but the percentage bred would no doubt have been larger but for the fact that I had to disturb the larvæ just as they were spinning up, so that several died in pupating. The moths are quite handsome little insects, the markings on the fore wings being very rich, and they vary considerably in the intensity of the markings, one or two of the specimens being very dark indeed.—WILLIAM J. OGDEN; 1, West Bank, Stamford Hill, N., London, February 18th, 1907.

THE first volume of Mr. J. W. Tutt's 'Natural History of the British Butterflies' is announced for immediate publication by Mr. Elliot Stock. It is intended as a text-book for students and collectors, and deals with the world-wide variation and geographical distribution of butterflies. It will be very fully illustrated by photographs from nature.

CAPTURES AND FIELD REPORTS.

DAPHNIS (CHEROCAMPA) NERII AT LANCASTER.—I beg to report the capture, at Lancaster, of the oleander hawk-moth (*C. nerii*) on September 18th, by one of Lord Ashton's workmen. It was taken at rest on one of the buildings inside the works, and the man who caught it kept it in a box for two days, and then a friend of mine, Mr. James Stalker, got the moth and brought it to me to set. It was in very fair condition considering its captivity. Can you give me any data when *C. nerii* was last caught in England?—G. RALPH; 4, Albert Road, Skerton, Lancaster.

[There are seven records in the 'Entomologist' of the capture of *C. nerii* in Britain during the past ten years. The dates are:—1896: one specimen at Sowling, Kent, captured in a house, end of July. 1900: one in a dining-room at Yalding, Kent, September 18th; and one in Teignmouth, October 23rd. 1901: one at Barrhead, Scotland, end of September (?1900), on a sheaf of corn. 1903: one at rest on a yew-hedge in a garden outside Atherstone, Warwickshire, October 9th. At a meeting of the Lancashire and Cheshire Entomological Society, held on November 16th, 1903, a specimen found on board a steam-

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G

ship at Liverpool was exhibited. 1904: one specimen was captured as it rested on a bathing-machine at Eastbourne, July 14th. Earlier records will be found, Entom. xxiv. pp. 195, 221. The finding of two larvæ of this species at Eastbourne in October, 1859, was reported in the 'Entomologists' Weekly Intelligencer,' vol. xii. p. 140. These died, and one is led to suspect, from the particulars given, that the larvæ were probably those of *S. convolvuli*, which species was fairly common in England in 1859, and its larva was recorded from Devonshire in October of that year.—ED.]

LESTES DRYAS, Kirb., IN IRELAND.—Mr. H. M. Edelsten informs me that he has had specimens of this somewhat rare British dragonfly sent him from Ireland. They came from Caragh Lake, Co. Kerry, and were taken early in September, 1906. The only other Irish record seems to be that of the capture of a specimen near Athlone in 1894, by Mr. J. J. F. X. King.—W. J. LUCAS.

PLUSIA MONETA IN NORTHAMPTONSHIRE.—In my note on *P. moneta* (ante, p. 40) the county should be Northamptonshire, not Nottinghamshire.—F. J. RASELL; Theedon Road, Northampton.

A FORTNIGHT IN CUMBERLAND.—In July, 1906, my friend Mr. A. E. Gibbs, of St. Alban's, very kindly asked me to spend my fortnight's holiday at St. Bees, Cumberland, where he had taken a house for part of the summer. Unfortunately it was unsettled and wet most of the time, so that we were unable to do as much with the butterflies as we could have wished. Although we kept a sharp look-out around St. Bees, and also in Eskdale (which we visited several times) and in Wastdale, for the Erebias and *Coenonympha dorus*, we did not see a specimen of either. *Satyrus semele* was fairly common on St. Bees Head, and along the coast towards Nethertown. The majority of the specimens are of the dark "heath" form, but the males vary *inter se* in the amount of tawny colour on the upper side of the hind wings. I have one male which has three spots on the upper side of the fore wings, the extra ones being unocellated and just below the normal lower spot, and there is an extra dot on the right fore wing just above the lower normal spot. We also took several females which have extra spots between the normal ones. The females of *Lycæna icarus* have the orange spots well developed both on the upper and under sides, and are slightly suffused with blue on the upper side. Nearly every evening we indulged in sugaring in a lane running past the house down to the shore, where there were many convenient posts. The best species taken were *Mamestra furva* and *Noctua umbrosa*, the former of which we secured in some number, but the majority were worn. *Xylophasia lithoxylea* and *X. monoglypha* swarmed, and the latter varied to a remarkable degree—from the colour of the darkest brown velvet, practically black, through intermediate forms to the type. One of the lighter forms is particularly beautiful, being of a mottled appearance with an almost white patch on the inner margin of the fore wings, and a very dark area in the middle of the wing just below the discoidal spots. Several other species varied towards darker forms, viz., *Leucania conigera*, *L. lithargyria*, *Axylia putris*, and *Hadena dentina*, and Mr. Gibbs obtained a nice female of *Agrotis exclamationis*, which is very dark and has the markings coalesced into an irregular patch. One or two even-

ings we tried duskling in the lanes, but only obtained a few species, including *Hepialus humuli*, *H. velleda*, *Dianthæcia capsincola*, *D. cucubali*, several *Plusias*, *Gnophos obscuraria*, &c. We had one rather exciting evening's sugaring at Eel Tarn, in Eskdale. This is a small lake about eight hundred feet above sea-level, lying amongst the hills to the north of the 'Woolpack Inn' at Boot, and is surrounded by a "sheep-fence" formed of posts about four feet high, supporting wire netting with barbed wire running along the top. As the wire netting had been fastened on the outside of the posts, we were obliged to get over in order to spread the sweets, and found the ground was extremely wet and spongy. After dark it was very difficult to pick one's way between the bog-holes, and before long both of us went into water up to our knees. I also managed to gouge a piece out of my hand on the barbed wire. To add to our discomfort it turned out a wet evening, and a thick mist came down, so that we should have had some difficulty in finding our way back, had we not taken one of the men from the inn as our guide. The bag was a poor one, only *Noctua festiva*, and one or two dark *Hadena pisi* and *H. thalassina* being taken; but *Phryganea varia* swarmed on every post. On the way up we took one or two *Hepialus velleda* just before dusk, flying amongst bracken, and previously we had captured a few *Crambus margaritellus* on the edge of the lake. We found only one *Larentia cæsiata*, resting on a rock at about a thousand feet on the hills opposite Boot, and a few *Mixodia schulziana*.

With the kind assistance of Rev. E. N. Bloomfield we have been able to name the following Diptera of those taken:—*Tipula scripta*, female (Eskdale); *Thereva nobilitata* (St. Bees); *Chilosia illustrata*, abundant in places on railway bank at St. Bees; *Syrphus albostriatus* and *S. ribesii*; *Volucella bombylans*, *Eristalis arbustorum* (these four species at St. Bees); *Xylota segnis* (Eskdale).

Amongst the Hymenoptera I captured a male *Cilissa leporina*, the identification of which has been confirmed by Mr. Edward Saunders. I do not think this species is often taken so far north, as all the localities given in Mr. Saunders's book are in the southern and eastern counties.

Of the Neuroptera taken may be mentioned *Panorpa germanica*, of which we obtained some strongly marked specimens at the foot of Hardknot Pass.

The following is a list of all the Lepidoptera observed, St. Bees being the locality unless otherwise stated:—*Argynnis aglaja*, *Satyrus semele*, *Epinephele janira*, *E. tithonus*, *Cænonymphæ pamphilus*, *Polyommatus phœbe*, *Lycæna icarus*, *Zygæna filipendulae*, *Nudaria mundana*, *Hepialus humuli*, *H. velleda* (and at Eskdale), *Odonestis potatoria*, *Leucania conigera*, *L. lithargyria*, *Axylia putris*, *Xylophasia lithoxylea*, *X. monoglypha*, *Charæas graminis*, *Cerigo matura*, *Mamestra sordida* (Eskdale), *M. furva*, *M. brassicæ*, *Apamea basilinea*, *A. didyma*, *Miana strigilis*, *M. fasciuncula*, *M. literosa*, *Caradrina morpheus*, *C. alsines*, *C. taraxaci*, *C. quadripunctata*, *Agrotis segetum*, *A. exclamationis*, *Noctua plecta*, *N. c-nigrum*, *N. festiva*, *N. rubi*, *N. umbrosa*, *N. baja*, *N. xanthographa*, *Triphæna orbona*, *T. pronuba*, *Amphipyra tragopogonis*, *Miana typica*, *Dianthæcia capsincola*, *D. cucubali*, *Euplexia lucipara*, *Aplecta nebulosa* (Eskdale), *Hadena dentina*, *H. oleracea*, *H. pisi* (Eskdale),

Choristis umbratica, *Habrostola tripartita*, *Plusia chrysitis*, *P. iota*, *P. nigeraria*, *P. gamma*, *Hypena proboscidalis*, *Crocallis elinguaria*, *Boarmia spinulata*, *Gnophos obscuraria*, *Acidalia dimidiata*, *A. marginepunctata*, *Srenia cistraria*, *Panagra petraria*, *Abraxas grossulariata*, *Larentia alismata*, *L. cassiata*, *Emmelesia alchemillata* (Eskdale), *E. albulata*, *E. inornata*, *Eupithecia nanata*, *Hypsipetes sordidata*, *Melanthis ocellata*, *Melanope sociata*, *M. montanata*, *M. galata*, *Campetogramma bilineata*, *Charis populata*, *C. associata*, *Eubolia limitata*, *Tanagra atrata*, *Scopula umbrosalis*, *S. dubitalis*, *S. crataegella*, *Scopula lutealis*, *Pionea virginalis*, *Hydrocampus nymphæata*, *Crambus margaritellus*, *C. perlellus*, *C. tristellus*, *C. culmellus*, *Aphomia sociella*, *Tortrix podana*, *T. ribeana*, *Chrysoperla laetiflora* (Eskdale), *D. holmiana*, *Mixodia schulziana* (Eskdale), *Ephippiphora trigeminana*, *Catoptria hypericana* (Eskdale), *C. cusa*, *Trycheria aurana*, *Xanthosetia zoegana*, *Conchylis straminea*, *Chrysoteuchia flavella*.—PHILIP J. BARRAUD; Bushey Heath, Herts, February 14th, 1907.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, February 6th, 1907. Mr. C. O. Waterhouse President, in the chair. The President announced that he had nominated Mr. Frederick Merrifield, Mr. Edward Saunders, F.R.S., F.L.S., and Mr. George Henry Verrall, to be Vice-Presidents for the session 1907-8. Mr. Charles Kimberlin Bram, of 22, Burnside Road, Tamboers Kloof, Cape Colony; Mrs. Catherine Maria Moore, of Holmefield, Oakholme Road, Sheffield; and Mr. Alfred Ernest Tonge, of Aincroft, Reigate, were elected Fellows of this Society.—Mr. E. A. Cockayne brought for exhibition, a collection of Lepidoptera made by him at Tongue, North Sutherland, between June 80th and July 18th, 1906, comprising many species not hitherto reported from the county. It was noticeable that the several species showed little tendency to melanism.—Dr. T. A. Chapman, exhibited bred specimens of *Hastula hyerana*, Mill., from the neighbourhood of Hyères, to illustrate how the species varied, one or two, especially the two darkest December males, strongly suggested that the darkening of the colour of the wings was due to injury by cold, not to a more perfect, because prolonged, maturation. Miss M. E. Fountaine, a number of Anthocarid and Melitæid butterflies from various localities in Europe, Asia Minor, and Algeria, showing a wide range of variation.—The President, a female example of the genus *Thorytis*, from Mengo, in Uganda. There were with it in the same tube one small and two large Workers, which he thought would probably be the means of identifying the species at some future time. The Workers closely resembled specimens in the Museum named *T. nivea*, which are said to be the same as *nigricans*.—The Rev. F. G. Lowe showed various aberrant forms of Swiss butterflies, including *Lycaenias galatea* ab. *fulvata*, Lowe, from Martigny; an example of *Lycaenias virgo*, from Pontresina, with the black markings on the under side in the wings almost entirely absent, save one very large kidney-shaped spot, slightly tinged with white at the centre of each wing; and a pair of *Thysia napi* var. *bryoniae* taken in cop. at Caux; the male

not only suffused as in *bryoniae*, but also having the female markings.—Colonel Charles T. Bingham exhibited the pupa of a Tineid moth, of the genus *Brinsitia*, from Upper Burma, presenting with its surroundings a remarkable mimetic resemblance to the head and neck of a snake; and a case illustrating the curious habits of the butterflies of the genus *Gerydus* and *Alotinus*, which join with ants in attending *Aphidæ* for their sweet excretions.—The Rev. F. D. Morice, a very remarkable gynandromorphous specimen, from Silchester, of the common fern-visiting saw-fly, *Strongylogaster cingulatus*, F.; the dividing line between the male and female portions running longitudinally, not transversely, from end to end of the creature, a characteristic in the opinion of the President, unique.—Mr. Percy L. Lathy, F.Z.S., communicated “Notes on the Indo-Australian Papilionidæ”; and Mr. Ernest A. Elliott, F.Z.S., and Mr. Claude Morley, a paper “On the Hymenopterous Parasites of Coleoptera.”—H. ROWLAND-BROWN, M.A., *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*Thursday, January 24th, 1907.*—Mr. R. Adkin, F.E.S., President, in the chair.—*Annual Meeting*: the Treasurer's balance-sheet was read, and showed that the Society was satisfactory financially. The Council's Report of the condition and progress of the Society was then read, and showed that its position of usefulness was still maintained. The President then read his Annual Address, including in it remarks on the progress of entomology generally during the past year. Votes of thanks were unanimously passed to the retiring Officers and Council. The following is a list of those gentlemen elected to serve as Officers and Council for the ensuing year:—President: R. Adkin, F.E.S.; Vice-Presidents: W. J. Kaye, F.E.S., and H. Main B.Sc., F.E.S.; Treasurer: T. W. Hall, F.E.S.; Librarian: A. W. Dods; Curator: W. West (Greenwich); Hon. Secretaries: Stanley Edwards, F.L.S., F.Z.S., and H. J. Turner, F.E.S.; Council: F. B. Carr, T. A. Chapman, M.D., F.Z.S., F.E.S., A. Harrison, F.L.S., F.Z.S., F.E.S., A. L. Rayward, F.E.S., A. Sich, F.E.S., R. South, F.E.S., and E. Step, F.E.S.

Ordinary Meeting.—Miss Margaret Fountaine, F.E.S., of West Hampstead, was elected a member.—Messrs. Harrison and Main exhibited a series of *Boarmia repandata*, mainly from Isle of Man parents, with series from Cornwall, Delamere, and Isle of Lewis; and contributed notes on their occurrence and variation. The captured Isle of Man specimens were taken from off rocks.—Mr. Main, a living larva of *Charaxes jasius*, received from the South of France, and called attention to its wonderful protective coloration, shape, and to the fact that the curious mask of the head is shed as a whole.—H. J. TURNER, *Hon. Report Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*January 21st, 1907.*—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. J. T. Fountain showed a beautifully varied series of *Hybneria defoliaria*, Cl. It included specimens almost unicolorous, of a dark umber colour; others with the same dark umber as a ground colour, with dark bands or bars, in some cases broad, dark, nearly black, and sharply defined; then there were the usual light brown forms; the usual ones with light ground and cross bars, amongst which were some with clearly defined, broad, almost black bars.—Mr. Hubert Langley exhibited various

Lepidoptera from near Leamington, including *Lymantria monacha*, L., not uncommon, *Boarmia roboraria*, Schiff., *Myelois cibrella*, Hb., &c. —Mr. L. Doncaster made an appeal for help in connection with the Royal Society's enquiry into progressive melanism.—Mr. W. E. Colling showed an unidentified dipterous larva, which had been sent to him as destructive to currant bushes, but which he thought were only accidentally associated with them.—Mr. G. T. Bethune-Baker, a beautiful lot of Pieridæ of the genus *Delias*, from New Guinea and the Australian region, including several new species.—COLBRAN J. WAINWRIGHT, Hon. Sec.

RECENT LITERATURE.

Catalogue of the Lepidoptera Phalæna in the British Museum. Vol. VI.
By Sir GEORGE F. HAMPSON, Bart. Pp. i-xiv, 1-532. With
Atlas of twelve plates in colour. London: Printed by Order of
the Trustees. 1906.

EIGHT years ago the first volume of this comprehensive and elaborate work was reviewed in the 'Entomologist,' and vol. vi. is now before us. Although entitled a Catalogue, each volume is not simply a list of names and references, but practically a monograph of the family or subfamily with which it is concerned. Every species is described, and figured also where this has not been adequately done before.

In the present volume the Cucullianæ, the third of the fifteen subfamilies into which Sir George Hampson divides the family Noctuidæ, is dealt with. This subfamily, "characterised by its trifid neuration of the hind wing combined with spineless tibiae and smooth eyes surrounded by eye-lashes of bristle-like hairs," comprises 692 species belonging to 111 genera.

Associated with the key to genera (pp. 2-7) is a table showing the Phylogeny of the Cucullianæ. Following the diagnosis of each genus is a key to the species belonging to that genus.

Twenty-three genera comprise more than six species each, and the largest of these are *Cucullia*, Schrank (101 sp.); *Empusada*, Hmpsn. (12 sp.); *Oncocnemis*, Led. (57 sp.); *Homohadena*, Grote (12 sp.); *Graptolitha*, Hb. (48 sp.); *Antitype*, Hb. (20 sp.); *Bryomima*, Staud. (12 sp.); *Trichoridia*, Hmpsn. (10 sp.); *Conistra*, Hb. (88 sp.); *Amathes*, Hb. (80 sp.); and *Cosmia*, Ochs. (25 sp.).

Thirty-six genera each include but a single species, and of these the following are new:—*Neogalea* (t. *braziliensis*, sp. n.); *Brachygalea* (t. *leucorhabha*, sp. n.); *Cheligalea* (t. *scopariae*, Dorfm.); *Argyrogalea* (t. *argentea*, Hufn.); *Argyromata* (t. *splendida*, Cram.); *Opsigalea* (t. *ocellata*, Walk.); *Harpagophana* (t. *hilaris*, Staud.); *Ammetopa* (t. *codeti*, Oberth.); *Protophana* (t. *cervina*, H. Edw.); *Rhodochlæna* (t. *botonga*, Feld.); *Andesia* (t. *œnitis*, sp. n.); *Ectochela* (t. *canina*, Feld.); *Homonocnemis* (t. *fortis*, Grote); *Copitype* (t. *pagoda*, Alph.); *Caffristis* (t. *ferrogrisea*, Hmpsn.); *Dryotype* (t. *ovina*, Grote); *Xylo-type* (t. *capax*, Grote); *Neunichtis* (t. *trijuncta*, Walk.); *Hypnototype* (t. *placens*, Walk.); *Elvesia* (t. *diplostigma*, Hmpsn.); *Rhynchaglæa* (t. *scitura*, Butil.); *Grammoscelis* (t. *leuconeura*, sp. n.); *Omphaloscelis*

(*t. lunosa*, Haw.); *Austramathes* (*t. purpurea*, Butl.); *Brachycosmia* (*t. digitalis*, Grote).

In *Cucullia*, Schrank (*t. artemisiæ*), are included *Euderæa*, Hb. (*t. asteris*), *Eucalimia*, Hb. (*t. gnaphalii*), *Callænia*, Hb. (*t. umbratrica*), *Argyritis*, Hb. (*t. artemisiæ*), and *Rancora*, Smith (*t. strigata*).

Croceago, Schiff., which is the type of *Lampetia*, Curtis, and *Hoporina*, Blanch., is fixed by Sir George Hampson as the type of *Xantholeuca*, Steph. (1881). *Jodia*, Hb., to which Stephens referred *croceago* when sinking *Xantholeuca* (Brit. Mus. Cat.), is here reserved for the North American *rufago*, Hb., the type and only species.

Of the ten species included by Staudinger (Cat. Lep. Pal. 3rd ed., p. 177) in *Heliphobus*, B., four are here placed in *Leucochlæna*, a new genus, of which *hispida*, Geyer, is the type; three other species are referred to *Blepharidia*, Püngler, and one to *Ulochlæna*, Led. The remaining two seem not to belong to the Cucullianæ at all.

Bombycia, Hb., Tent., is rejected, and Stephens's genus of that name is used for *viminalis*, Fab. (the type), and three other species.

Satura, Schiff., *adusta*, Esp., and *protea*, Schiff., are associated with *lichenea*, Hb., in *Eumichtis*, Hb., of which genus the last-named species is fixed as the type. *Protea* (*seladonia*, Haw.) was first referred by Stephens (Haust. iii. 33) to *Polia*, and afterwards (Brit. Mus. Cat.) placed in *Dichonia* (*Hadena*, Sect. D.); Staudinger and others have included *protea* in *Dryobota*, Led. Sir George Hampson, however, gives *areola*, Esp., as the type of *Dichonia*, Hb., and *furva*, Esp., as the type of *Dryobota*, Led.

The following list of fifty British species included in Cucullianæ is drawn up to show not only generic changes, but also the order in which they occur in the arrangement; the number after each name refers to the page in the volume. The genus *Cucullia* has been previously adverted to, so will not be further mentioned:—

- Leucochlæna*, Hampson, g. n., *hispida*, Geyer (Hüb.), 188. Type.
- Four other species.
- Brachionycha*, Hw., *sphinx*, Hufn., 202. Type of *Asteroscopus*, Boisd., and of *Petasia*, Steph.
- B. nubeculosa*, Esp., 203. Type.
- Bombycia*, Steph., *viminalis*, Fab., 219. Type. Also of *Cleoceris*, Boisd. (1840).
- Aporophyla*, Guen., *luteolenta*, Schiff., 295.
- A. australis*, Boisd., 287. Type.
- A. nigra*, Haw., 288.
- Cloantha*, Guen., *solidaginis*, Hüb., 239. Type.
- Lithophane*, Hb., *semibrunnea*, Haw., 244.
- L. socia*, Rott. Type.
- Graptolitha*, Hb., *ornithopus*, Rott., 258.
- G. lambda*, Fabr., 259. Type *Rhizolitha*, Curtis (1833).
- G. furcifera*, Hufn., 261. Type.
- Xylina*, Ochs., *vetusta*, Hb., 281. Type.
- X. exoleta*, Linn., 285. Type of *Axylia*, Hb., and of *Calocampa*, Steph.
- Dichonia*, Hb., *areola*, Esp., 294. Type. Also of *Xylocampa*, Gn. (1837).

Neomusca, Hb., *annulata*, Linn., 306. Type. Also of *Miselia*, Hb., Tent., ined.

Nemoura, Linn., 308.

Nemoura, *formosa*, Linn., 313. Type. Also of *Diphthera*, Hb., Tent., ined.

Nemoura, Hb., *annulata*, 321. Type. Also of *Epunda*, Dup., *annulata*, 321.

Nemoura, *annulata*, Schiff., 328.

Nemoura, *annulata*, Schiff., 348. Type.

Nemoura, Hb., *annulata*, Schiff., 361. Type of *Polia*, Hb., *annulata*, 361.

Nemoura, *annulata*, Tent., 369.

Nemoura, *annulata*, *annulata*, Hb., Tent., ined.

Nemoura, *annulata*, *annulata*, Esp., 378, = *empyrea*. Type. Six figures.

Nemoura, *annulata*, *annulata*, Thunb., 424. Type.

Nemoura, Hb., *annulata*, Linn., 437. Type.

Nemoura, *annulata*, *annulata*, Schiff., 441. Type.

Nemoura, Hb., *annulata*, Schiff., 449.

Nemoura, *annulata*, Hb., Type of *Glaea*, Hb., Tent., ined.

Nemoura, *annulata*, Schiff., 457. Type of *Dasypanpa*, Guen.

Nemoura, *annulata*, *annulata*, Haw., 469. Type and only figure.

Nemoura, Hb., *annulata*, Schiff., 475, = *pistacina*, Schiff., type of *Nemoura*, which is included in *Amathes*.

Nemoura, Hb., *annulata*, 479.

Nemoura, *annulata*, 484. Type of *Rusina*, Steph., which is merged in *Nemoura*.

Nemoura, *annulata*, 488.

Nemoura, *annulata*, 488. Type.

Nemoura, *annulata*, Hb., 487. Type of *Dyschorista*, Led.

Nemoura, Hb., *annulata*, Esp., 494. Type. Also of *Cirraedia*, Hb., Tent.

Nemoura, Hb., *annulata*, Schiff., 498. Type of *Ochria*, Hb.

Nemoura, *annulata*, Esp., = *silago*, Hb., 501.

Nemoura, *annulata*, Schiff., 502. Type. Also of *Citria*, Hb., and *Lamia*, Hb., Tent.

Nemoura, Hb., *annulata*, 502.

Nemoura, Hb., *annulata*, 502. Type of *Cirrhia*, Hb.

It may be noted that there are three hundred and fifty-four figures in the plates in the Atlas which accompanies this volume, and that there are systematic and alphabetical Indexes.

It is necessary to say that Catalogues such as the one under consideration are of great interest and importance, as this must be obvious to all who are interested. In the volumes previously issued, the figures up to date of publication are brought together in the *Archives* (vols. ii. and iii.), *Noctuidæ* (vol. v.), *Arctiidae* (vols. ii. and iii.), and *Macrolepidotidae* (vol. v.).

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LEAF-INSECTS IN CAPTIVITY. (*PULCHRIPHYLLIUM CRURIFOLIUM*, SERVITH.)

By W. H. ST. QUINTIN, F.E.S., &c.

TOWARDS the end of May, 1906, I was given some thirty or forty ova of a *Phyllum* which had been found by a friend who was cruising with Lord Crawford, on the yacht 'Valhalla,' last winter and spring. A good many of the perfect insects and a few larvæ had been collected on the island of Mahé (Seychelles group), and carried on the yacht with great care, and very considerable trouble. A cabin, electrically heated, was set apart for them, and branches of the food-plant (wild guava) provided. The food caused a difficulty, for the branches taken on board were soon eaten, and no more could be obtained till Cairo was reached, and a fresh supply brought on board from the Giza Gardens. In the end thirteen were safely landed, and were on view in the Insect House at Regent's Park for some weeks afterwards. Ova were laid freely on the yacht. Some were left with Captain Stanley Flower at Cairo, others were presented to the Zoological Society, while I was fortunate enough to be entrusted with the remainder.

What happened to those left at Cairo I never heard, but the ova deposited at the Zoological Gardens hatched, but I believe they did not live long. Luckily, I was lent a copy of the 'Bulletin de la Société Vaudoise,' in which Mons. Morton relates how in 1903 he reared from the egg another species collected in Ceylon (*P. scythe*). Otherwise I should never have realized the necessity of providing so much moisture as well as heat that the insects evidently require.

Following Mons. Morton's methods, I placed my ova on silver-sand in a box, over which a piece of muslin, doubled, and kept saturated, was stretched. The box and its contents were sprayed with a fine garden syringe twice a day, and stood in a small stove where the temperature was kept at a high level,

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and the atmosphere as near saturation-point as possible, to suit *Phalaenopsis* and other heat and shade-loving orchids. The temperature has varied night and day between 70° and 85° Fahr.

The first larva did not appear until the last week of August, and they continued hatching until the end of the year, though mostly in September and October; but two larvae appeared in December, and one of the last remaining ova hatched on January 8th. This irregularity seems strange, for the ova were all deposited between the 7th April and the 15th May. That this is the case sometimes with these insects in the wild state is shown by the fact that on the islands, amongst the adults, were found, as I have said, a few examples in the early larval stages.

The ovum bears a general resemblance to those of the *P. scythe* figured in the 'Bulletin' referred to, and is wonderfully like the seed-capsule of certain flowering plants, as Mons. Morton remarks. The wall of the ovum is rough in texture, and of an umber-brown colour, as is the characteristic lid or stopper, which is pushed off by the young larva as it emerges.

The larva when newly hatched is of a pale amber colour, streaked and splashed with dull rose. It is lively, and moves with a curious swinging action, which is exaggerated when the insect is alarmed [as in the case of the young *Mantis*, and also the young "stick-insect" (*Bacillus*)], and which may be intended as a menace.

At this tender stage, the only losses up to the present time occurred— one larva getting crushed by the lid of the cage, while two others were killed and sucked dry by some small spiders which managed to get through the perforated zinc. I found the larvae soon took to the beech-leaves, which, following the example of Mons. Morton, I offered them. As the season advanced, and it became difficult to find fresh beech foliage, I got the insects to take to that of the common oak, with a little unwillingness on their part; and later on to some young bushes of *Q. ilex*, which seems to satisfy them completely. Probably there will be no necessity again to unsettle them, as I have a good supply of plants, and I find that the *ilex* stands the heat and damp of the stove well enough.

I have found it impossible to note the periods of skin-casting exactly, as the larvae are of such different ages. Besides, their extraordinary similarity to the *ilex* leaf makes close observation difficult. But my gardener, F. Puddle, who has had the insects from the first constantly under his eye, and to whose care any credit for success is due, believes that the largest individuals (stranded), now 2*3* in. long, have in the twenty-one weeks up to the present date (February 4th) changed their skins eight or nine times.

The larvae after each change devour the shed skin immedi-

ately, or the greater part of it, and then rest for about twenty-four hours before beginning again upon the leaves. The male larva, as in *P. scythe*, has considerably longer antennæ, and the fore legs are much less expanded than in the female.

The cage, even in winter, is thoroughly sprayed with tepid water once a day, and it is interesting to see the thirsty larvæ lower their mouths to the pendant drops. Others, avoiding the shower, shrink closer to the under sides of the leaves, and cleverly incline their bodies to let the water run off the more quickly.

The insect, when feeding, still keeps to the under side of the leaf, and merely twists its head round so as to bring its mandibles within reach of the edge of the leaf. Really diurnal, the larvæ at this stage are most inclined to feed soon after dawn, and again during the last hour of daylight. I have at present twenty-nine larvæ, and unless the short days of an English winter have delayed their growth, some of them should soon be reaching the imago state, for Mons. Morton found his first perfect insect (a male) four months after the hatching of the first egg.

Since the above was written, four of the male larvæ have entered into the imago state, the first on February 14th.

Scampston, York.

[A plate illustrating this article will appear in a future number.—ED.]

NOTES ON THE DIURNI OF CENTRAL AND SOUTHERN FRANCE, AND CORSICA.

By W. G. SHELDON, F.E.S.

A GOOD many of those who collect the European Rhopalocera, and who travel a considerable distance for some or most of them, do not realize the number of much wanted species that occur freely in the magnificent series of forests surrounding Paris. It is true one sees a good many notes in Kane and in other authors of the occurrence there of certain species, but the opinion generally seems to hold that the records refer chiefly to the long distant past, and that the species recorded are no longer to be found in the haunts described.

This was my own opinion until quite recently, but a conversation I had with M. H. Brown, who has for years past worked the district, led me to change it. M. Brown has most kindly made out for me a list of the Diurni observed by him as constantly occurring within a radius of, say, fifty miles from Paris at the present time, and I find from this that ninety-nine

species frequent this area, including, amongst others, the following much wanted and local species:—*Apatura iris*, *A. ilia* and var. *clytie*, *Limenitis populi* and var. *tremulæ*, *Araschnia levana*, *Melitæa maturna*, *Argynnис adippe* var. *cleodoxa*, *Erebia medusa*, *Hipparchia briseis*, *H. arethusa*, *Satyrus statilinus*, *Enodia dryas*, *Pararge achine*, *Cænonymphæ hero*, *Thecla pruni*, *Chrysophanus hippothoë*, *Lycæna alcon*, and *Heteropterus morpheus*.

With the object of making the acquaintance of some of these species, I accompanied M. Brown on the evening of July 7th, 1906, down to the forest of Villers Cotterets, some forty miles north-east of Paris, our chief objects being the Apaturidæ—*Limenitis populi*, and *Araschnia levana* var. *prorsa*.

The following morning broke fine and cloudless, and the day turned out to be an ideal one for butterflies; it was, however, the only quite suitable day I was favoured with whilst in the district.

The Apaturidæ were in great force, sitting on a road running through the forest, imbibing at the damp spots, or at horse-droppings. Of the two species, *Apatura ilia* was by far the most plentiful, about one-third of the examples being the type; the other two-thirds were var. *clytie*. It was most exhilarating to come across half a dozen of these grand fellows settled on the road, on a patch. They were not difficult to net, and I suppose I must have captured some sixty specimens; quite one-half, however, were released, not being perfect. Amongst my captures was a fine example of ab. *iliades*. *Apatura iris* was not abundant, and thus very difficult to capture; only two examples, both males, were taken. *Limenitis populi* I did not see; M. Brown said I was a fortnight too late for it. The larvæ of *Araschnia levana* were abundant on the nettles, feeding in companies, each containing several dozens. This larva feeds during the day in damp shady spots. The broods are not difficult to distinguish, for, although they do not defoliate a patch of nettles to the same extent as a nest of *Vanessa urticæ*, they are sufficient to account for the defoliation of one or two stems; they do not seem subject to parasites, nearly every larva producing a pupa. Odd early imagines of the summer form (var. *prorsa*) were flying about in the road; they have much the appearance on the wing of a *Thecla*, and are equally difficult to follow in flight, for, apart from their inconspicuous dark colour, they move very rapidly. When settled on the road, or on a leaf, they have a decided habit of fanning the wings, after the manner of *Issoria lathonia*.

Other species noted in the forest of Villers Cotterets included *Brenthis ino*, plentiful and of large size, but past their best; *Limenitis sibylla*, abundant; *Dryas paphia*, abundant; *Lycæna arion*, a few; *Melitæa maturna*, one much worn specimen.

Whilst staying in this part of France, I paid a visit, on July

10th, to the forest of Compiegne. The Diurni here were similar in species to those of Villers Cotterets, but, amongst others, I captured several examples of *Argynnis adippe* var. *cleodoxa*, and one of *Dryas paphia* var. *valezina*. *Thecla w-album* was abundant on the blossoms of the bramble.

I was much interested with a (to me) new bait for the Apaturidæ, which M. Brown introduced to my notice, and which, I understand, is commonly used in France; this is a very strong smelling cheese, known as "marolle." I purchased one of these cheeses, which are not large, and placed portions of it on the road running through the forest where the "emperors" are abundant. Unfortunately, the only day on which I could try it was not a favourable one, with but little sun, and thus the bait did not have a fair chance; but it certainly attracted more "emperors" than any of the patches of natural bait lying about, and I believe that, given a good day, it would have proved very successful; at any rate, though strong smelling, it is certainly not so objectionable in the knapsack as some of the baits used in England.

I left Villers Cotterets on July 12th, *en route* for Vizzavona, Corsica, where I arrived on the 14th.

The butterflies of Corsica—and of Vizzavona and Corté especially, where I stayed whilst in the island—have been so much written up that there is very little that is new to be said about them. Everyone goes at the same time of the year, takes the same species, and takes them in the same places.

At Vizzavona the usual species were abundant, with the exception of *Papilio hospiton*, and I had no difficulty in obtaining all I required of them during the ten days I spent there. Of *P. hospiton*, ten imagines were observed, of which I netted nine; only four of these were, however, worth retaining. I searched the mountains for many miles round for larvæ, and almost missed them, except for two examples, which I found on the first day. Thanks, however, to the kindness of a friend, who gave me a hint of the kind of locality I ought to search, I succeeded, during the last two days of my stay, in obtaining twenty-seven larvæ; they were found upon a very local species of fennel, which I could only discover in three small localities. Unfortunately this plant dries up very quickly, and as the larvæ resolutely refused to feed upon every other umbelliferous plant I could find—at least a dozen in number, and including the common fennel (*Foeniculum vulgare*)—I only succeeded in getting eighteen to pupate, and most of these are very small.

At Corté, in the beautiful gorges of the Restonica and the Tavignano, I found the local form of *Hipparchia semele* var. *aristeus* abundant, and captured many fine examples of the magnificent Corsican form of that finest of European Argynnids, *Dryas pandora*. In the Restonica Gorge I obtained half a dozen

good examples of the interesting form of *Pyrgus sao* var. *therapne*, which I did not see elsewhere.

I left Corsica, July 29th, for Beauvezer, which is situated at about 4000 ft. altitude, in the Verdom Valley, in the heart of the Basses Alpes. My especial object in visiting this locality was to obtain a series of the very local *Erebia scipio*, which is said to be abundant there. For some reason, however, I could not hit off the species, and had to go away without even a specimen. Other species observed here were—*Pieris daplidice*, common; *Rusticus argyrogномон*, abundant, with beautiful blue females; *Melitaea didyma*, with fine straw-coloured females; *Erebia stygne*, *E. tyndarus*, *E. goante*, and *E. neoridas*; *Satyrus actaea*, and some beautiful forms of *Anthrocera fausta*, and other brilliant “barnets.”

On my way home I stayed a few days at Digne, arriving there on August 6th, and leaving on the 10th. Mr. Tutt, who was also staying at Digne, and I had some days' collecting, chiefly in the cross ravine, the stream of which empties into the torrent “eau chaudes,” a quarter of a mile beyond the baths. We found this ravine a magnificent locality at this time of the year, almost every butterfly in the neighbourhood appearing to be congregated there, probably attracted by the stream of water, and the flowers that grew in its bed so luxuriantly.

Amongst the species noted were—*Erebia neoridas*, in swarms, but almost all males, until August 9th, on which day the females were equally abundant; *Hipparchia arethusa*, also in swarms; *Satyrus fidia*, not infrequent; *S. statilinus*, common; *Hipparchia semele*, abundant; *Satyrus actaea*, abundant, with the females in fine order; *S. cordula*, passé; *Melitaea deione*, the second brood, common but small; *Leucophasia sinapis*, abundant; *L. duponchelii*, second brood, one example only; *Chrysophanus dorilis*, abundant and fine; *Polyommatus meleager*, males common, females two specimens only, both of which were of the type form; *P. bellargus*, males abundant, females not seen; and *Thecla betulæ*, not infrequent at flowers. I was much surprised to find dozens of *Satyrus hermione*, in finest condition, settled on the trunks of the apple trees in the “eau chaudes” valley. I had taken them equally abundant and fine, a month earlier in the season, two years previously.

A day spent in the mountains in the vicinity of the Dourbes resulted in half a dozen good specimens of *Erebia scipio*, but in little else. Full-fed larvæ of *Papilio alexanor* were abundant wherever the food-plant occurred in the vicinity of Digne.

ON SOME NEW CENTRAL AMERICAN VESPIDÆ.

By P. CAMERON.

(Concluded from p. 64.)

Zethus (Didymogastra) punctinodus, sp. nov.

Black, densely covered with short white pubescence; the lower third of the clypeus, a line on the base of the thorax, two spots, wider than long, on the apex of the scutellum, two longish lines, straight on the inner, roundly narrowed on the outer side, a broad lanceolate line on the sides of the abdominal petiole, incised above near the apex, a mark on the top of the base of second segment, rounded on the outer sides, incised on both sides in the middle, a lanceolate line, the narrowed end at the base, on the sides of the narrowed base of the second segment at the apex, and a line on the apex of second segment, distinct above, indistinct below, pale yellow; the raised apices of the second and third segments fuscous; apical joints of the antennæ orange-yellow below. Wings tinged with fuscous, distinctly clouded at the apex. ♂. Length, 12 mm. to end of second segment.

Acapulco, Mexico.

Apex of antennæ thick, forming a roll, the two end joints curved, thick, clearly separated. Clypeus sparsely punctured, densely covered with depressed white pubescence; the front and vertex closely, distinctly punctured; the ocelli thus . . ., the hinder separated from each other by a greater distance than they are from the anterior, and by a slightly greater distance than they are from the eyes. Clypeus longer than usual, compared with the width; the apex with two short teeth. Apex of pronotum raised into a narrow horny keel, of a darker colour than the yellow line at its apex. Mesonotum closely punctured, without keels or furrows; the scutellum more strongly but not so closely punctured, the centre depressed at the apex. Post-scutellum narrowed to a broad rounded point. Metanotum broadly depressed in the middle, the sides rounded; it is transversely striated. Abdominal petiole not quite so long as the thorax, distinctly narrowed at the base, less so at the apex; it is shining, distinctly but not strongly or closely punctured. The narrowed base of the second segment is about one-fourth of its length; the segment shining, densely pruinose, the apex flat, smooth, the horny reflexed part wide; on the third segment it is narrower, and not so strongly reflexed. Tibiæ testaceous in front.

The peduncle of the second abdominal segment is shorter than it is in the other species described in this paper. Belongs to Saussure's Section A.

Zethus (Didymogastra) erythrogaster, sp. nov.

Black; the abdomen, except the narrowed basal part, red; the under side of the antennal scape, a small spot over each antenna, a slightly larger one in the inner edge of eye incision, a small spot near the top of outer orbits, a narrow line along the keel on base of pronotum, two spots on scutellum, narrowed and rounded on inner side, a small mark below and in front of tegulæ, a narrow line,

widened laterally on apex of first abdominal segment; a larger triangular mark on the sides in front of this, and a narrow line on the apex of the first abdominal segment, yellow. Legs black, the knees yellowish, the apical third of the femora, and the base of the tibiae more broadly in front, rufous. Antennæ with a hook, the apical joints rufous. Wings fuscous violaceous, the tegulae dark red. ♂. Length, 16 mm.

Mexico.

Abdominal petiole as long as the thorax, the narrowed base half the length of the dilated apex, which is longish ovate; the second segment with a narrowed neck half the length of the apex, which is cup-shaped, becoming gradually roundly widened towards the apex, followed by a reflexed pale horn-like part. Clypeus wider than long, strongly punctured, the apex depressed, smooth, broadly rounded. Front and vertex closely, rugosely punctured, the ocelli . . . the hinder separated from each other by the same distance as they are from the eyes. Thorax closely punctured, the metanotum almost smooth, densely covered with grey pubescence; the metapleuræ bare, shining, smooth, except the lower part, with stout striæ. The third and fourth abdominal segments are closely punctured, the others smooth; the red on the apical is tinged with yellow.

Belongs to Saussure's Division *Didymogastra*, B. The antennal hook is narrow, curved, fully four times longer than it is thick. Mandibles widened at the base, without distinct teeth, the apex smooth, shining, bluntly rounded.

Zethus (Didymogastra) carinicollis, sp. nov.

Black; the clypeus, mandibles broadly in front to near the apex, under side of antennal scape, a small spot above each antenna, a narrow interrupted line on post-scutellum, a spot on the sides of apex of petiole, produced below backwards along the sides, a longish spot, narrowed at the base, on the base of the thickened part of second abdominal segment, and a narrow line, all round, on the apices of the second and third abdominal segments, lemon-yellow. The outer side of the four anterior femora at the apex, their tibiae entirely, and a line on the basal half of the hind tibiae behind, and two longish, moderately wide marks on the apical slope of metanotum—the marks widest below—bright lemon-yellow. Apical three joints of antennæ pale ochraceous yellow, including the "hook," which is only slightly curved, is broad at the base, and becomes gradually narrowed to a sharp point. Wings hyaline, the stigma and nervures black. ♂. Total length, 10 mm.

Mexico.

Abdominal petiole as long as the thorax, the basal fourth narrowed, the rest becoming gradually widened at the base, and not much narrowed at the apex. The second segment has a narrow, cylindrical petiole about two-thirds of the length of the rest of the segment, which is cup-shaped, rounded at the base, transverse at the apex; it is, as is also the first, smooth, shining, except for a narrow punctured band on the apex; the other segments are strongly punctured at the apex.

Clypeus broad, sparsely, weakly punctured; its apex broadly rounded, with a short, stout tooth on the sides of the middle third. There is a large, rounded apical tooth and a short, much less distinct apical one on the mandibles. Base of thorax transverse, raised into a thin, pale horny projection, which is continued along the basal half of the propleuræ, below the top; the apex bluntly rounded laterally, the centre rather flat, the middle with a narrow furrow; except in the centre it is closely, strongly, more or less obliquely striated. Front and vertex strongly, closely punctured; the ocelli in a triangle; the mesonotum is less closely punctured and the scutellum still less closely punctured; the post-scutellum smooth, punctured at the base. Pro- and mesopleuræ strongly punctured, the metapleuræ smooth, except for some fine obscure striæ above and along the apex.

This is a *Didymogastra*. The last joints of the antennæ can neither be called "a rolled spiral" nor a "hook," but the appendage approaches in form more the latter than the former.

Zethus nitidinodus, sp. nov.

Black; a broad curved band on the apex of the clypeus, its upper edge irregular, a small spot above each antenna, a small one on the outer orbits above, a line on the sides of post-scutellum, about three times longer than wide, a mark, wider than long, narrowed on the inner side, on the sides of pronotum, a conical mark, obliquely narrowed above, below the tegulæ, and two large, irregularly pyriform marks, dilated below and with the outer side oblique, straight, on the apex of metanotum, a line on the apex of first abdominal segment, narrowed in the middle and continued backwards on the sides below for about as far as the width of the segment, and a much narrower line on the apex of the second, pale cream-yellow. Abdomen very smooth and shining, the apical segments thickly covered with grey pubescence; the petiole not so long as the thorax, and not much longer than the second segment; its basal fourth narrowed, spinose laterally at the base; the thickened apical part distinctly narrowed at the base, slightly narrowed at the apex, which is depressed. Second segment bell-shaped, the base narrowed into a short neck, about twice longer than wide; it is about one-fourth longer than it is wide at the apex, which is neither reflexed nor channelled; but the third segment is distinctly reflexed. Wings fuscous violaceous, the nervures and stigma black. Antennæ with a longish, stout, little curved hook. ♂. Length, 22 mm.

Mexico.

Front strongly, closely punctured, the vertex more sparsely and weakly so, its hinder edge smooth. Clypeus sparsely, distinctly punctured, its apex bluntly, shortly bidentate, the sides curved. Ocelli in a curve, the hinder separated from each other by a distinctly less distance than they are from the eyes. Base of thorax above clearly separated, keeled behind, the sides distinct, but not projecting. Parapsidal furrows distinct, complete. Scutellums smooth, not furrowed, the apex broadly narrowed behind. Depression in centre of metanotum deep, the lobes broadly rounded. Apical two joints of antennæ dark cream-coloured, the hook black, its apex reaching to the base of

the tenth joint. Mesopleural furrow narrow, crenulated. Mandibles with strong scattered punctures at the base. There is a narrow keel on the basal half of the mesonotum.

This is a *Zethusculus*, and belongs to Saussure's Section B. (Syn. Am. Wasps, p. 29). It is one of the largest species, and is probably related to *Z. lœvinodus*, Smith, of which only the female is known. Smith does not describe the form of the basal two abdominal segments. The present species can hardly be its male; e. g., *lœvinodus* has the metathorax opaque and immaculate, not smooth and shining, and with two large white maculae; in Smith's species, too, the abdomen is immaculate.

Zethus fortistriolatus, sp. nov.

Black; the under side of antennal scape, a narrow line round the top of pronotum and the apices of the abdominal segments narrowly, yellow, two marks on the apical slope of metanotum, narrow above, becoming gradually widened from the middle towards the apex, the inner side straight, the outer rounded, of a paler yellow colour; the outer side of the four front tibiæ testaceous. Wings hyaline, darker in front, very iridescent, the stigma dark testaceous, the nervures black. Pro-, meso-, and metanotum strongly, closely, slightly, obliquely striated. Abdominal petiole slightly longer than the thorax, gradually slightly narrowed from the middle to the base; the apex flattish above. The narrowed basal part of the second segment not much longer than wide, the rest bell-shaped, becoming gradually roundly widened towards the apex, which is distinctly narrower than the length of the segment. ♀. Total length, 16 mm.

Nicaragua.

Vertex strongly, irregularly striated, more or less strongly punctured, the front closely, regularly, somewhat strongly striated, the striæ extending to the hind ocelli. Clypeus wider than long, the middle of the apex (forming one-third of the whole) transverse, clearly separated; the punctuation is strong, the punctures longish, deep, intermixed with striæ; there is a strong, short, longitudinal keel in the centre of the top. Ocelli in a longish triangle, the hinder separated from each other by a little less distance than they are from the eyes. Temples wide, rounded, not much shorter than the top of the eyes. Occiput transverse, sharply margined. Thorax more than twice longer than wide, the base transverse, margined, its sides not projecting, the apex broadly, roundly narrowed, the metanotum formed of two rounded lobes. Pleuræ strongly punctured, the punctures long, clearly separated, those on the base of the propleuræ almost forming striæ. Abdominal petiole irregularly punctured in the middle above, the apex smooth, depressed towards the punctured part; the sides strongly, closely punctured, except at the base and apex; the rest of the abdomen is almost smooth and densely covered with fuscous pubescence. The scutellum is strongly, closely punctured, except on the sides, the middle depressed; the post-scutellum is obliquely depressed at the base and apex, the apical slope being longer and narrowed to a blunt rounded point. The pubescence on the head and thorax is longish,

fuscosus, and not very dense. There is the appearance of a macula on the sides of the clypeus. There is a triangular tubercle above the antennæ; its sides are obliquely sloped; the middle shining; below it is continued as a keel down the face; on either side above is a yellow spot. There is a distinct, bordered furrow on the apex of the second segment. The striation on metanotum is oblique above, in the centre transverse, not so close and stronger.

This species has the appearance of an *Eumenes* with its long non-dilated abdominal petiole. It belongs to the group of *Z. strigosus*, Säuss.

CURRENT NOTES.

By G. W. KIRKALDY.

(Concluded from p. 39.)

90. PETERSEN, W.: "Die Morphologie der Generationsorgane der Schmetterlinge und ihre Bedeutung für die Artbildung." *Mém. Ac. Sci. Péterb.* (8) xvi., No. 8, 1-84, figs. 1-64 (1905). [Lepidoptera].
91. LINDEN, M. VON: "Über den Einfluss der Sauerstoffentziehung während des Puppenlebens auf die Gestaltung der Schmetterlinge." *C. R. 6 Congr. Int. Zool.* 491-6. [Lepidoptera].
92. *Id.* : "Physiologische Untersuchungen an Schmetterlingen." *Z. Wiss. Zool.* lxxii. 411-44, plate 25 (1905). [Lepidoptera].
93. *Id.* : "Recherches morphologiques, physiologiques et chimiques sur la matière colorante des Vanesses." *Ann. Sci. Nat. Paris* (8) xx. 295-363, plates 11-12 (1905). [Lepidoptera].
94. KOTINSKY, J.: "Preliminary Notes on Lantana Insects in Hawaii." *Proc. Hawaiian Livestock Breeders' Ass.* pp. 69-78, figs. 3-8 (1906). [Diptera, Lepidoptera, Hemiptera].
95. *Id.* : "Hornfly and its Parasites in Hawaii." *Op. cit.*, 78-80, f. 9 (1906). [Diptera, Hymenoptera].
96. SMITH, J. B.: "Explanations of Terms used in Entomology." *Brooklyn Ent. Soc.* pp. i.-vii. and 1-154, plates i.-iv. (1906).
97. FOLSOM, J. W.: "Entomology, with special reference to its Biological and Economic Aspects." (Philadelphia), pp. 1-485, plates i.-v. and numerous text-figs. (1906).
98. BUENO, J. R. DE LA TORRE: "Life Histories of North American Waterbugs." *Canad. Ent.* xxxviii. 189-97 (June 5th) and 242-52 (July 7th, 1906). [Hemiptera].
99. FELT, E. P.: "The Gypsy and Brown-tail Moths." *Bull. N. York State Mus.* (103), pp. 1-42, plates 1-10 (two of these being coloured) (July, 1906). [Lepidoptera].
100. *Id.* : "Twenty-first Report of the State Entomologist." *Op. cit.* (104), pp. 47-186, plates 1-10, text-figs. 1-48 (Aug. 1906).
101. SCHNEIDER, A.: "The Phenomena of Symbiosis." *Minnesota Bot. Studies*, Bull. 9, pp. 923-48 (May 31st, 1897).

102. TOWER, W. V.: "A New Method of preparing Wings and other parts of Insects for Study." *Ent. News*, xvii. 218-9 (June, 1906).
103. WHEELER, E. G.: "British Ticks." *Journ. Agric. Sci.* i. 400-29, plates v.-x. (March, 1906).
104. SORAUER, P., LINDAU, G., and REH, L.: "Handbuch der Pflanzenkrankheiten" (New Edition), iii. 70-80, figs. 5-28 (1906).
105. HART, J. H.: "The Cockroach as a possible friend to the Cacao Planter." *Bull. Misc. Inform.*, Trinidad Bot. Dep., No. 48, pp. 289-40 (Oct., 1905).

In three volumes of over 1500 pages, with 884 text-figures, Distant has briefly discussed (58) a part of the Oriental Hemiptera, *viz.*, the Heteroptera, Cicadidæ, and Fulgoroidea of India, Ceylon, &c. The volumes will be useful on account of the, usually, excellent figures, each genus being figured. Further details, in many cases, would, however, have been of value.

Brown (59) notes that the weevil *Aræocerus fascicularis* feeds on Ignatius' bean (*Strychninos ignati*) in the Philippine Islands. Strychnine is one of the deadliest human poisons known, yet the beetle actually breeds in the cavities it has bored in the seed.

Stretch's paper (60) consists of nearly 350 figures of American Arctiidæ, without other letterpress than the explanations.

The Blepharoceridæ are recorded from New Zealand for the first time by Chilton (61), who describes and figures some larvæ. The adults have not yet been reared.

Crombrugghe de Picquendaele has catalogued (63) the 1041 Microlepidoptera of Belgium, with synonymy, localities, food-plants, &c., while Kirkaldy has enumerated (68) the genera of fifteen families of Hemiptera, with their synonymy and type-species, and with references to figures.

Schrottky (67) describes and figures a Cicadid from South America with a remarkably malformed head.

The 'Bericht' (65-66) is the most complete (as a whole) of all entomological records, but is sadly dilatory. We now have a 'General Record' and 'Coleoptera' for 1904 (the 'Zoological Record' for 1904 having long ago appeared), and the Hymenoptera and Lepidoptera for 1901, the other orders not having advanced beyond 1900. The recorder for the Introduction and Coleoptera has, moreover, sacrificed completeness and accuracy to (comparative!) speed, his contributions being far the least satisfactory. In the 'Allgemeines,' 67 titles out of the first 148 (A-G), are marked as unseen, including papers in such well-known channels of publication as the 'Canadian Entomologist,' S. B. Ges. Nat. Freunde Berlin (the recorder is a German, the 'Bericht' is published in Berlin!), Trans. Linnean Soc. London, and the 'Entomologist'! C. S. Banks of Manila is (for the recorder) identical with N. Banks of Washington, D.C. Dealing with foreign tongues, it is inevitable, perhaps, that such mistakes

should occur as "secundary," "live-history," "alluving," "injurious," "Hursley," "pratique" (for "pratiche"), "Girault," "taid" (for "laid"), &c. Mr. Bouskell is cited for a paper on "Three weeks in the wilds of"! the locality being left to the imagination of the reader. Bibliography is always a thankless task, but the composition and reduction of one of the two principal records of entomology ought to be more complete and careful than that.

The 'Zoologischer Jahresbericht' gives (64) *inter alia*, a list of the principal papers on Entomological Anatomy, Bionomics, &c., published during 1905, with brief summaries of some of these. It is useful as being the earliest, but is very incomplete.

Nos. 69-74 have nothing directly to do with entomology, but the latest maps (70-1 and 74) are, surely, always welcome to entomologists, as well as topographical information on any out-of-the-way country (69, 72, and 74).

Morgan offers an alternative suggestion (75) to Boveri's theory, and considers that so-called gynandromorphism "may be due to two (or more) spermatozoa entering the same egg, one only fusing with the egg nucleus, and the other not uniting but developing without combining with any parts of the egg nucleus. . . . The products of division of the paired nucleus will account for the female part of the embryo, while the products of the division of the single sperm nucleus will account for the male characters of the other parts."

Heymons (76) notes that parthenogenesis occurs in some species of *Machilis*. Thienemann (77) deals with the biology of the pupæ of Trichoptera, while Brues (78) discusses certain points in the life-history of Stylopids.

Carpenter (79) notes that *Drosophila* is negatively geotropic, positively heliotropic; mechanical irritation of the fly has a kinetic effect, since it induces locomotion; the same is true of light. Holmes continues his observations on the reactions of *Ranatia* to light, dealing also with *Notonecta* (80). Mjöberg has a note on "mimicry" in the nymphs of *Coriscus (Alydus) calcaratus* (81), while Green (82) relates the killing of a Millipede by the nymph of *Ectrichodia (Physorhynchus) linnæi*.

A number of interesting papers on Orthoptera require notice. Kreidl and Regen deal with the stridulation of *Gryllus campestris*, having largely used the phonograph in their researches (83); Voss discusses (85) at great length the thorax in *G. domesticus*, with its appendages, and, after treating of the comparative anatomy and mechanism, compares the Orthoptera with other insect orders. Hancock deals with the stridulation, oviposition, and a metathoracic secretory organ (86) in *Ecanthus fasciatus*. Röhler discourses on antennal sense-organs in *Tryxalis* and *Musca* (84).

Marchal notes the parasitizing of *Galeruca* by a Hymenopteron (87), while Von Wagner (88) treats of the genesis and development of socialism in Hymenoptera.

A number of papers on Lepidoptera also invite attention. Von Linden has recently issued three papers, principally on experiments with the pupæ of Vanessids (91-93), while Peterson (89-90) deals with the morphology of copulatory organs in the same order and their value for species-determination.

Kotinsky (94) discusses pests of Lantana, describing and figuring an Ageomyzid Dipteron, a Lepidopteron, a Coccoid, and a Tingid. The same author (95) deals with the Hornfly (*Hæmatobia serrata*) and its parasites.

Smith (96) has published an indispensable and long-wanted list of terms used in entomology, with their explanations. The plates are good and clear, except the one dealing with the nomenclature of colours, which is certainly unlike anything used by entomologists, and which omits many—indeed most—of those actually largely in use. A modern plate of this sort is still much wanted.

Folsom's Text-book (97) is somewhat like that of Carpenter, published in 1899, as regards its scope, but is still different from anything in the field. About one-third of the work is taken up with a review of anatomy and development, the remainder being biological and speculative.

Bueno (98) has worked out in considerable detail the life-histories of two American Waterbugs, viz., *Belostoma fluminea*, Say, and *Ranatra quadridentata*, Stål.

Felt (99) has published a brief report on *Porthetria dispar* and *Euproctis chrysorrhœa*, on account of the great danger of these moths being introduced into New York State.

The Twenty-first New York Report (100) is of the usual scope of these valuable bulletins. Among the contents may be mentioned, "Studies in Cecidomyiidae" (pp. 116-32, figs. 15-48), and notes on "Mosquito Control" (pp. 109-16, plates 3-10).

Schneider's general *résumé* of the phenomena of Symbiosis (101) has been overlooked in zoological records. He classifies them as follows:—

- I.—Incipient (Indifferent).
 - 1. Accidental. 2. Contingent.
- II.—Antagonistic.
 - 1. Mutual antagonistic (mutual parasitism).
 - 2. Antagonistic (parasitism).
 - a. Obligative.
 - b. Facultative.
 - 3. Saprophitism.
 - a. Facultative.
 - b. Obligative.
- III.—Mutualistic Symbiosis.
 - 1. Nutricism (semi-mutualistic).
 - 2. Mutualism.
 - 3. Individualism.
 - a. Semi-.
 - b. Complete.
- IV.—Compound.

Tower (102) recommends the use of hydrogen peroxide instead of potash.

Wheeler (103) discusses the British Ticks. Sorauer's 'Handbook of Plant Diseases,' now in a new edition, has reached the Arthropoda; the latest fascicule deals with noxious Crustacea and Myriapods.

Hart (105) states that the "Common Cockroach" is supposed to feed on minute red perithecia of the Cacao Canker Fungus in the interstices of the bark of Cacao trees. If this is found to be so, the Cockroach will be regarded, when in abundance, as a valued friend to the Cacao planter, as destroying the means of reproduction of the fungus.

NOTES AND OBSERVATIONS.

OXYPTILUS PILOSELLÆ IN HERTFORDSHIRE.—In the collection of Lepidoptera given to me by Mr. T. F. Furnival, and referred to on page 36, I have found five specimens of *Oxyptilus pilosellæ*, which were taken by him on the canal-bank near Tring Station on August 18th, 1905. This species has not previously been recorded for Hertfordshire, so that I have pleasure in adding the name to our county list. Dr. T. A. Chapman has kindly confirmed the identification of the specimens. Mr. T. H. Court, of Market Rasen, was with Mr. Furnival at the time the capture was made, and also took some specimens.—PHILIP J. BARRAUD; Bushey Heath, Herts, March 4th, 1907.

"CURRENT CRITICISM."—My attention has been drawn to the article "Current Criticism," by Mr. Kirkaldy, in the March number of your Journal. Mr. Kirkaldy censures Mr. Distant for want of "accuracy in dates," and gives citations from the volumes on the Rhynchota in the "Fauna of British India" Series. I wish to say that, so far as these examples are taken from vol. iii. of the work in question, I, as editor, and not Mr. Distant, should be blamed for the errors in dates. With regard to the date of the text of the 'Coquille,' I would point out that the title-page of the 'Voyage Coquille Zool.,' vol. ii., bears the date 1830, that this date was at first accepted by Messrs. Sherborn and Woodward (Ann. & Mag. Nat. Hist. ser. 7, vol. vii., 1901, pp. 391-392), and that the correction (*tom. cit.*, ser. 7, vol. xvii., 1906, pp. 335-336) was not published till after Mr. Distant's vol. iii. was in print. Further, the errors in dates quoted by Mr. Kirkaldy, however reprehensible in themselves, involved no question of priority.—C. T. BINGHAM; March 12th, 1907.

BARRETT'S 'LEPIDOPTERA OF THE BRITISH ISLANDS.'—A GOOD BOOK SPOILED BY ITS INDEX.—Some fifteen years ago we were all delighted at the announcement of a comprehensive work on the Lepidoptera of the British Islands from the pen of that veteran entomologist, Charles G. Barrett. The work has just come to an end, unfortunately after the decease of the author. Whatever may be our views as to the classification adopted, we shall value the book as affording a lasting record of the author's vast personal knowledge in the life of so many

THE ENTOMOLOGIST.

... and I have anxiously awaited the issue of the ...
... in the expectation that it would contain a specific ...
... least reference to any particular species to ...
... consider. But what do we find? A so-called ...
... work, including Families, Genera, ...
... as it gives no clue as to what genus a ...
... one may, as likely as not, have to ...
... to find the reference to the species ...
... work as a book of reference is correspond- ...
... for this serious omission cannot be laid ...
... perfect right to adopt any method of ...
... had he lived to see the completion of his ...
... taken the necessary means to enable his ...
... Nor can Mr. South, who, we are told, ...
... portions of the work through the press, be ...
... omission; his methods in such matters are ...
... of any such suggestion. Is it too late to ...
... may yet see the error of their ways and be ...
... comprehensive specific index, and thus raise this ...
... able British entomologist to the deserved ...
... of reference? Even if it were issued as ...
... the original subscribers would, I venture to ...
... the influence that it would have upon the ...
... publisher's hands must be manifest.—

March, 1907.

... 5. for "vol. xii." read "vol. vii."

... AND FIELD REPORTS.

...—A very perfect specimen of this fine cock- ...
... 1907, on a fruit-stall in Mansfield ...
... presented to me by the stall-keeper; it is now ...
... most probably it was introduced with ...
... number of the 'Entomologist' for 1900 a ...
... is given. Mr. Lucas remarks that it is ...
... fluorescence, which gives it the appearance, in ...
... phosphorescent, and that is a very good descrip- ...
... intended to collect the cockroaches in 1906, but ...
... the under-mentioned species locally:—*P. germanica*,
... *P. australasiae*, and *N. holosericea*.
...—WILLIAM DAWS; 39, New Wood Street,

...—A specimen of this moth was attracted by ...
... his house at Quorn, in Leicestershire, and was ...
... I am sorry to say, it was damaged in the capture. ...
... collecting at the time, he kindly gave the specimen to ...
... know the exact date of capture, but it was some time ...
... possibly imported in some stage with tomatoes. ...
... double-brooded? Usually the imago appears in March ...
... WILLIAM DAWS.

THE PAIRING OF *CERASTIS LIGULA*.—I never remember seeing any statement as to whether our two closely allied species of *Cerastis* (*C. ligula* and *C. vaccinii*) pair in the autumn or in spring. I was therefore much interested in discovering a pair of *C. ligula* in cop. on an ivy-leaf in my garden at 5.15 p.m. on November 25th, 1906. They had separated at 9 p.m. the same evening, and I kept the female with the hope of her laying eggs before she died. To-day I find her dead, but no trace of any eggs. I don't ever remember taking this species in the spring, and therefore still feel doubtful as to when she really does oviposit. Can any of your readers solve the question?—Rev. G. H. RAYNOR; Hazleleigh Rectory, Maldon, February 4th, 1907.

P.S.—Last night (March 27th) I took a female of this species at sallow. It may therefore be inferred that after pairing the female survives the winter, and oviposits in March and April.—G. H. R.

AMPHIDASYS BETULARIA VAR. DOUBLEDAYARIA.—Seeing your notice on "Melanism in Yorkshire Lepidoptera," by G. T. Porritt, F.Z.S. (ante, p. 23), I thought it might interest you to know that on the Lincolnshire Wolds var. *doubledayaria* appears to be the dominant form of *Amphidasys betularia*, as in the South-West Riding of Yorkshire. At all events, I have obtained a considerable number of pupæ, mostly under ash-trees, and all so far have been var. *doubledayaria*.—SAIRGNAR B. STEELMAN; Binbrook, Market Rasen, Lincoln, March 11th, 1907.

NOTES ON HERTFORDSHIRE INSECTS, 1906.—Captures in my light-trap at Bushey Heath during 1906 included the following species; those marked with an asterisk being new to my "light" list (which now totals three hundred and seven species), and one, *Gelechia diffinis*, is also new to the Hertfordshire list:—*Drepana binaria*, *Dipterygia scabriuscula*, *Calymnia pyralina*, *Selenia lunaria*, **Tephrosia crepuscularia*, *Eupithecia pulchellata*, *E. exiguata*, *Pelurga comitata*, **Scoparia dubitalis*, **Hedya dealbana*, **Plutella maculipennis (cruciferarum)*, **Gelechia diffinis*; also dark forms of *Axylia putris*, and a male and female *Spilosoma lubricipeda* with unusually large black markings. *Phigalia pilosaria* was taken as early as January 26th.

Sugaring in the garden was more successful than during the previous few years, and among others I took:—*Hydræcia micacea*, *Dipterygia scabriuscula*, *Apamea unanimis*, *Caradrina morpheus*, *C. cubicularis*, *Agrotis suffusa*, *A. saucia* (two females), *Noctua augur*, *Xanthia cerago*, *X. ferruginea*, *Polia flavigincta*, *Miselia oxyacanthæ* and var. *capucina*, *Agriopis apirlina* (one female, a rather dark form), *Hadena protea*, *H. genistæ*, *Orthosia lota*. A few *Plusia moneta*, *P. chrysitis*, *Hecatera serena*, *Pericallia syringaria*, *Hepialus humuli*, and many commoner species were taken at dusk in the garden, and *Gonoptera libatrix* occurred in the house in February and September. *Pieris rapæ* was first seen on April 11th, and on the same day three *Vanessa urticæ* were seen in the garden. One specimen of *Thecla w-album* was taken here on July 16th; and *Vanessa atlanta* was seen at sugar on October 14th.

Several visits were paid to Pré Wood, St. Albans, in the company of Mr. A. E. Gibbs, the first being on March 31st to sallows, when we took a single specimen of *Tæniocampa populeti*, and two *Pachnobia rubricosa*; while the commoner *Tæniocampidae* swarmed, accompanied

" *T. urticae* and *T. cruda*.
... when we took *Tephrosia*
... 18th, when *Pieris rapae*,
... *Apollis lundana* were also

" Town, near Tring, the first
... *luteola* and *Nisoniades* types
... other captures were *Lycaena*
... *mi*, *Crambus hortulius*,
... *subjectana*, and *Elachista*
... (August 4th) I found *Lycaena*
... their usual numbers. A few
... same spot as in previous years.
... is extremely local here, being

" need that *Anthophora pilipes* was
... the spring; the first male was
... *caerulea* on May 5th. *Psithyrus*
... Mercury Down on June 17th, and
... were taken on the same day.
... so far been named:—*Bombylius*
... *restalis pertinax*, *E. horticola*—all
... *caerulea stabilans* at Bushey Heath;
... Town.—PHILIP J. BARRAUD; Bushey

ENTOMOLOGICAL NOTES.

— AND NATURAL HISTORY SOCIETY.—
... F.E.S., President, in the chair.
... of *Hybena defoliaria*, bred from
... the imagines being dark and more
... the pupæ of *Asteropeplus nubeculosa* of a
... the pupæ when first changed; and also
... the pupæ of *Meliana flammæa*.—Mr.
... *Strymon w-album*, which he had cut
... it was still alive, although normally
... noted that the species hibernated as a
... Dr. Chapman, a large, very brown
... with antennæ brown beneath; and
... species set to show position of "tails" of
... Mr. Adkin, a series of *Eubolia cervinata*
... and stated that the larvæ could only be
... a long series of *Heliconius hydara* subsp.
... *argyritis* subsp. *rosina* from Columbia, to
... resemblance of the two species.—Mr.
... a long series of *Agrotis ashworthii*, bred
... and real notes on the breeding habits of the
... resultant imagines. About twenty-four
... figures.—Miss Fountaine, (1) the very local

form of the summer brood of *Pieris napi* var. *flavescens* from Mödling, near Vienna; (2) *Pieris daplidice* var. *bellidice* from Aix-en-Provence, and ab. *raphani* from Algeria; (3) *P. chloridice* from Asia Minor; (4) *Anthocharis cardamines* and its allies, *A. gruneri* from Greece, *A. damone* from Syria, *A. euphenoides* from South France, *A. eupheno* from Algeria, *A. belemia* and *A. falloni* from the desert district in Algeria, *A. pechi* and *A. charlonia* from South Algeria, *A. tagis* var. *bellezina* from Aix-en-Provence, and var. *insularis* from Corsica.—Mr. Hy. J. Turner read a paper entitled "Our Authorities: an Introduction to Entomological Literature," illustrating his remarks by a number of volumes issued previously to 1800, exhibited by Messrs. Adkin, Edwards, Sich, and himself.

February 28th.—The President in the chair.—Mr. H. W. Barter and Mr. F. D. Coote, of Camberwell, were elected members.—Dr. Chapman exhibited (1) a pupa of *Hastula hyerana* showing the jaws; (2) a specimen of *Capina alia* with a triple tarsus to the right hind leg; (3) a short series of *Leioptilus carphodactylus*, a plume new to Britain, taken at Folkestone by Mr. Purdey; and (4) some fine varieties of *Peronea cristana*.—Mr. South, an extremely pallid specimen of *Satyrus semele* taken near Canterbury.—Mr. Lucas, specimens of *Hybernia leucophaearia* from Oxshott.—Mr. Rayward, ova of a thorn moth laid in a row on a twig of blackthorn.—Mr. Newman, cocoons of *Dicranura bicuspis* on birch-bark overgrown with lichen from Tilgate Forest.—Mr. Turner, Coleoptera from Warroona, West Australia.—Mr. Adkin, long varied series of *Dianthaea carpophaga* from the South Downs, and gave notes on them.—A large number of lantern-slides were exhibited by Messrs. Lucas, Main, West (Ashtead), Dennis, and Tonge, illustrating life-histories, protective resemblance, egg-capsules of *Blatta* sp., marine algæ, ova of Lepidoptera, and rare plants.—
Hy. J. TURNER (*Hon. Rep. Sec.*).

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The usual monthly meeting of this Society was held in the Royal Institution, Colquitt Street, Liverpool, on February 18th, Mr. W. Mansbridge, Vice-President, in the chair.—The chairman communicated a paper entitled "Micro-Lepidoptera captured in Lancashire and Cheshire during 1906," and illustrated his remarks by specimens of all the moths referred to. There were no rare species among them, but about thirty additions to recent records were mentioned.—In illustration of the Tortrices of North Lancashire, Mr. C. H. Forsyth, F.E.S., of Lancaster, sent a box of some ninety species, collected mainly in the neighbourhood of Lancaster, including *Sciaphila penziana* from Arnside, *Conchyliis alternana*, *Aphalia orceana*, *Grapolitha penkleriana*, and *Dicrorampha saturnana* from Lancaster. This exhibit proved a very useful contribution to our records for the northern part of the county.—Mr. Robert Adkin, F.E.S., of London, sent for exhibition a pair of the tortricid moth *Tortrix pronubana*, one of the most recent additions to the British list, and which attracted much attention.—Other exhibits were a series of beautiful water-colour drawings illustrating protective colouration in butterflies and moths by Mr. Newall, of New Brighton; the careful colouring, &c., of the insects pourtrayed were much admired.—Mr. Richardson, several well-arranged cases of insects for educational purposes.

March 18th.—Mr. W. Mansbridge, F.E.S., Vice-President, in the chair.—The members heard with regret of the death of Mr. John Robson, of Hartlepool, an honorary member of the Society, and one who had taken considerable interest in its welfare.—Dr. W. Bell, J.P., gave a most interesting demonstration of his methods of larva-preserving, and exhibited numerous beautiful examples of the art; some species being mounted upon preserved plants, others upon artificial foliage, many of the larvae being accompanied by their respective imagines set in their characteristic resting attitudes. Dr. Bell also exhibited a specimen of *Plusia aurifera*, one of three captured in Cornwall by Mr. Moore. The insects remained unrecognized until recently. There are only two other records of this rare insect in Britain, *viz.* one now in the British Museum collection, and another in a Liverpool collection formed by the late Mr. Robertson, of Limehouse, which is still in the possession of his family.—Other exhibits were:—Mr. B. H. Crabtree, fine varieties of *Arctia caia*: (1) with yellow hind wings; (2) a chocolate form with nearly unicolorous fore wings; (3) with all the dark markings of a dull ochreous buff colour; (4) a specimen with white fringes to the fore wings, and reduced dark markings. Mr. Sopp, the cockroach *Phoraspis leucogramma*, Perty, taken in the Liverpool Docks, this being a Brazilian species not previously recorded as having occurred in Europe. Mr. W. A. Tyerman, a long and variable series of *Taniocampa opima* bred from Wallasey ova; some very dark forms were included. Mr. W. Mansbridge, a short series of *Zygæna minos* from Argyllshire, together with the Welsh form for comparison.—A paper by Mr. Robert Newstead, F.E.S., on the genus *Glossina* (tsetse flies) and *Stomopys* was announced for the next meeting on April 15th.—H. R. SWEETING and Wm. MANSBRIDGE, *Hon. Secs.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—February 18th, 1907.—Annual Meeting.—Mr. G. T. Bethune-Baker, President, in the chair.—The usual formal business of Reports, Election of Officers, Council, &c., having been concluded, Mr. J. T. Fountain showed living *Pieris rapæ*, L., and *Larentia multistrigaria*, Haw., the former having been taken on the wing on Feb. 15th, the latter having been bred.—Mr. H. Willoughby Ellis, the following Coleoptera:—*Barynotus schönerri*, Zett., from Knowle, a species not previously taken in the Midlands. *Anchomenus puellus*, Dr., taken in winter in frozen reeds near Birmingham. *Olisthopus rotundatus*, Pk., a variety taken at Bewdley, with much narrower thorax than the type. The insect was altogether more slender, but the thorax was narrower in proportion; it made it look like a new species.—Mr. G. T. Bethune-Baker, a boxful of the brightest coloured moths, as brightly coloured and beautiful as any butterflies. They were all from New Guinea, and chiefly consisted of the genus *Milonea* (Geometers) and various Agaristidæ, and included various new species.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—February 5th, 1907.—Dr. T. A. Chapman exhibited bred specimens of *Hastula hyerana*. Fifteen examples emerging between November and January were decidedly darker than any of four hundred specimens emerging at the normal time, *viz.* between August and October. It was suggested that the low temperature rather than the prolonged pupal period was the

cause of the darker coloration. — Mr. E. A. Cockayne, between sixty and seventy species illustrative of his notes on collecting in North Sutherland; an aberration of *Acronycta leporina* entirely white save for a large central black spot on the fore wings; and a fine series of *Camptogramma bilineata* spotted and striated with black were specially noteworthy.—Mr. H. M. Edelsten, *Acalla lorquiniana* from Norfolk. Attention was drawn to its similarity in miniature to *Senta maritima*, and to the fact that it produced similar varieties.—Mr. V. E. Shaw, *Pachys betularia*, including var. *doubledayaria* and several intermediates between this variety and the type; four nights' sempling at Bexley yielded fourteen types, fifteen var. *doubledayaria*, and seven intermediate forms.—Mr. P. H. Tautz, *Cosmia pyralina* taken at light in July, and *C. affinis* bred from larvae beaten from elm; both at Pinner.—Mr. E. A. Cockayne read a paper entitled "Notes from North Sutherland," in which was recorded the capture of many species apparently hitherto not reported so far north in Great Britain.

February 19th.—Mr. E. A. Cockayne exhibited *Leucania flavigena* and vars. *rufa*, *lutea*, and *argillacea*, melanic *Nonagria geminipuncta* from Bournemouth, *N. sparganii* from South Ireland, and many other allied species.—Mr. H. M. Edelsten, long series of many of the "wainscots"; also a pupa, *in situ*, of *Meliana flammea*, ova of *Nonagria geminipuncta*, and puparium of *N. typhæ* and *N. cannae*.—Mr. L. W. Newman, pupæ of *M. flammea* bred in captivity; the larvae, instead of pupating in stems, had drawn reed blades into perfect cylindrical form. Also a pupa of *Petasia nubeculosa*, which, although a year old, retained the greenish transparent appearance characteristic of newly-formed pupæ.—Mr. V. E. Shaw, a series of *Toxocampa pastinum*, Walmer, July, 1906, and *Laphyga exigua* bred in December.—A discussion on the "wainscots" was ably initiated by Mr. H. M. Edelsten, who, in his opening remarks, gave interesting details of the life-history of many species.—S. J. BELL, Hon. Sec.

RECENT LITERATURE.

A Natural History of the British Butterflies, their World-wide Variation and Geographical Distribution: a Text-book for Students and Collectors. By J. W. TUTT, F.E.S. Vol. i., pp. 479, plates xx. London: Elliot Stock. Berlin: Friedländer & Sohn. 1905-1906.

ANOTHER work by the indefatigable Mr. Tutt. This time it is the first of what are to be several volumes devoted to the British butterflies, all treated in his exhaustive style. The volume just completed contains about eighty pages of introductory matter of a general character relating to the eggs and larvae, and deals with many of their characteristics, including the knowledge recently acquired of the association of some of them with ants, and of the carnivorous habits of certain species.

The rest of the volume, comprising nearly four hundred pages, is occupied with a detailed account of nearly all that is known of ten species—the eight British "skippers," the "small copper," and the

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placed in every case by a
line to which it belongs.
This with which the work
begins is the common *Rumicaria phil.* :
including the "coppers."
The first of their group
of species. It is succeeded
by *Colias phil.* This is followed by
four and four of the genus
Colias. To the species itself

and a modern one in
one of the geographical and
of these with temperature.
variations in colour or mark-
ings and hind wings, in suffusion,
information as to the localities
of the species. After this comes a full
account—of the egg itself and its
variations, its pupation and
pupa, its variations, and its
place of the imago in its widely
of the world, its habits and

British Lepidoptera,' of supply-
ing on all the points above men-
tioned the head "Time of Appearance,"
and afterwards, under the
small type. It is fair to say
of dates and places. Some will
have distributed a species they are
alone as they do, their value
the space they occupy. But, with
records of seasonal temperatures, &c.,
furnish abundant and in many
any who may desire to construct
account of climatal, seasonal, and
abundance, normal times of
the species of which these particulars

outline the comprehensive plan on
example, still drawn from the chapters
of its treatment of the subject under
is difficult to say what are the chosen
use; yet one may not write 'every-
the many spots where a specimen may
from the Atlantic to the Pacific, in
and from the warmest north temperate
Circle, and from the low hot plains of
the mountains to an elevation of from
15,000 ft. (in North-east Kunoa), it yet
to live; and, as in America it is said

to prefer dry, sandy, or gravelly barren spots, or the sides of paths in dry pastures or upland highways, frequently invading towns, and finding the hottest corners for its gambols, so in Europe it selects sand-hills and sand-dunes, sloping chalk-hills, and flowery wayside banks, meadows, wood-ridings, heaths and moorlands, mountain pasturages, and other innumerable different spots. In Britain it loves our open chalk-hills in the southern and eastern counties, the limestone slopes of the western and northern counties, the sandstone of the south-western—*e.g.* the downs at Halling (Ovenden), and at Freshwater (Hawes), the sand-hills at Deal (Tutt), and near Findhorn (Mutch), and is especially abundant on the dry Triassic sandstone area of the central and northern parts of Nottingham (Goss); the heaths at Newbury (Kimber), the moorlands of the Western Highlands (Tutt), rough stony ground edging the woods near Truro, and at Weston-super-Mare (Whittaker); whilst fine bright examples occur in the isles of Bute and the Great Cumbrae (Swinton)." And so for another couple of pages, taking us through various localities—the Channel Islands, Scandinavia, France, the Riviera, Germany, Switzerland, Northern and Central Italy, Bulgaria, Syria, India, China, the Japanese Islands, as well as Abyssinia, the Canary Islands, Madeira, and the Pamirs. All this is admirably described.

We are glad to see that another volume, to contain the "hair-streaks" and "blues," is in preparation, and will be published in 1907-8. The book will be the indispensable work of reference upon the subject of the butterflies found in Britain.

F. M.

Catalogue of British Orthoptera, Neuroptera, and Trichoptera. By the late C. W. DALE, F.E.S. Revised and corrected. Colchester: W. H. Harwood & Son. 1907.

PROBABLY students and collectors of the British Orthoptera, Neuroptera, and Trichoptera, though few enough still, are not quite so small a company as formerly was the case. The insects they are concerned with are no doubt somewhat difficult to preserve and to prepare for the cabinet, and when there do not make so fine a show as does a collection of Lepidoptera. But these insects possess one merit which places them in importance above all others—their antiquity. No scientific entomologist can therefore afford to remain uninterested in these orders, and we can with confidence recommend to his notice a catalogue of the British members of the orders, which Mr. W. H. Harwood has just issued; for one of the greatest helps to anyone working at a group of any kind is a good reliable list of the members included within its limits. Originally drawn up by the late Mr. C. W. Dale, F.E.S., it has been revised and brought thoroughly up to date by various entomologists working at the orders. Criticism is scarcely needed, but we might say that as the Orthoptera are graded as to their status in our fauna, the introduced and naturalized species, and the occasional visitors might have been separated, their position on the list being so widely different. One other cockroach, *Blabera cubensis*, might have been added to the visitors, two having been accidentally introduced into Oxford last year. The genus *Auridium* should, of course, be *Acridium*.

W. J. L.

OBITUARY.

WITH much regret we have to announce the death of Mr. JOHN EMMERSON ROBSON, of Hartlepool, and also of Mr. WILLIAM JOHN CROSS, of Quayside, Ely.

We understand that Mr. Robson had been failing in health for some time past, but it was not until about two months ago that his illness assumed a serious form, and he passed away on February 28th, aged seventy-four years. He occupied a high position among the lepidopterists of this country, and was also interested in other branches of Natural History. With the object of cultivating and fostering a taste for Nature Study he founded and conducted the 'Young Naturalist,' which in 1879 was started as a penny weekly magazine, and was furnished with the sort of information that the beginner could appreciate. At the conclusion of the third volume, in October, 1882, the weekly issue was discontinued, and vol. iv. commenced in December, 1882, as a monthly magazine, and the plates which had hitherto been plain were coloured in this and the succeeding volume. At the end of 1890 the publication had reached the last number of vol. xi., and the concluding one of the 'Young Naturalist,' the number for January, 1891, being the first of the 'British Naturalist.' Under the latter title three volumes were conducted by Mr. Robson, and he then determined to discontinue publication with the part for December, 1893. In January, 1894, the magazine was carried on, as a new series, by Messrs. J. Smith and L. Greening, assisted by Mr. Robson, but we believe for that year only; our copy stops short at No. 10.

An exceedingly careful and well annotated "Catalogue of the Lepidoptera of Northumberland, Durham, and Newcastle-upon-Tyne," by Mr. Robson, was published in the 'Transactions' of the local Natural History Society for those counties. The first part, dealing with the Macro-Lepidoptera, was issued in 1899, and the second part in 1902. Part i. of the Micro-Lepidoptera, comprising the Pyralidina and Tortricina, was produced in 1905. He was elected a Fellow of the Entomological Society of London in 1890.

Mr. Robson was a member of the Town Council, and held, or had held, many other important offices in Hartlepool, in the affairs of which town he took a deep interest, and especially in educational matters.

Mr. W. J. Cross passed away on March 20th, aged 73 years. For the last four years his health had been undermined in consequence of a series of operations, and it was from the effects of the last of these that he succumbed. He was a keen entomologist, and the very fine collection of Lepidoptera that he formed represents over forty years of enthusiastic collecting. All who were privileged to associate with Mr. Cross found him a man of kind and gentle disposition, and one who was always anxious to assist his fellow-entomologists. Many young beginners have to thank him for his kindly help, which was ever extended to them most willingly. As a collector, he was well known in the New Forest, where he spent many months during nearly every summer. His death will be deplored by a very large circle of friends.



Triena (Acronycta) psi.
Triena (Acronycta) tridens.
Ancillary Appendages $\times 12$, from photos by F. N. Clark (see p. 119).





Spines on Clasps of Ancillary Appendages of *T. (A.) tridens*, *psi* (4 vars.), and *cuspis*, $\times 16$, from Camera Outlines (see p. 119).

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NEW AMERICAN BEES.—IV.

By T. D. A. COCKERELL.

Bombus rufocinctus astragali, n. var.

♀. Similar to *B. rufocinctus iridis* (Ckll. & Porter), but the broad black band of the abdomen is without any red. This looks exactly like *B. edwardsii*, Cresson, and has until now always passed as that species. On comparing it with Pacific coast *edwardsii*, I noticed a difference in the length of the malar space, and wrote to Mr. Viereck to examine the material labelled *edwardsii* in the Cresson collection. This he kindly did, reporting as follows:—

(1.) Malar space about half as long as wide. Two females, Colorado; one female, Washington State; one female, Montana.

(2.) Malar space a little more than half as long as wide, rather quadrate. Female, California; female, Nevada.

The latter is the real *edwardsii*. I had labelled the Colorado insect as a new variety of *edwardsii*; but Mr. H. J. Franklin, to whom I sent a specimen, is confident that it is an extreme variety of *B. rufocinctus*, the structural similarity outweighing the remarkable colorational differences.

Hab. Boulder, Colorado, June 9th, 1905, at flowers (white) of *Astragalus* sp. (W. P. Cockerell). Also Ward, Colorado, at *Phacelia* (Cockerell), and Florissant, Colorado (Rohwer).

Nomada ceanothi, sp. nov.

♀. Length about 7 mm.; belongs to *Nomada* as restricted by Robertson, and is very close to *N. florilega*, Lovell & Ckll. (from Maine), from which it differs as follows:—Red of clypeus extending upwards in middle line, almost to antennæ; third antennal joint conspicuously shorter, its length little exceeding its apical breadth; flagellum more slender; hind femora less infuscated; second abdominal segment with a pair of extremely large lemon-yellow spots, more or less pyriform in shape; third with large yellow spots; fourth without spots; fifth with a pair of very dull spots. Characters distinguishing it from other allied species (such as *N. illinoensis* and *N. sayi*) are as follows: *no* trace of yellow at lower corners of face; antennæ long, fourth joint a little

shorter than twelfth; mesothorax exceedingly coarsely punctured, dull red, with one broad black band; scutellum bilobed, but rather small; pleura largely red; metathorax entirely black; ventral surface of abdomen red without yellow markings; first dorsal segment black right across at base; b. n. going a considerable distance basad of t. m.; mandibles simple.

Hab. Glencarlyn, Virginia, at flowers of *Ceanothus*, June 21st (Nathan Banks). On the same day and flowers, at the same place, Mr. Banks took *N. perplexa*, Cresson.

Nomada banksi, sp. nov.

♀. Length, 8 mm. or a little over; black, the markings of the head and thorax entirely dark ferruginous; abdomen with bright lemon-yellow markings; legs red, partly suffused with black. Face broad; clypeus, a small supraclypeal mark, labrum, mandibles (except apex), and lateral marks extending over summit of eyes, with narrow posterior orbits, all ferruginous; mandibles simple; antennæ dark reddish beneath, blackened above, third joint about as long as fourth, flagellum stout; mesothorax very coarsely and densely punctured, entirely black; scutellum moderately bigibbous, with a red spot on each prominence; metathorax all black; pleura with a large red patch below, and a red spot above; tubercles and tegulae red; wings dusky reddish; stigma ferruginous, nervures fuscous, b. n. just basad of t. m.; legs red, the middle and hind femora mainly black behind and beneath, hind tibiae blackish behind; anterior coxae with a small tubercle, but no spine; abdomen very finely punctured, black; first segment with a narrow yellow band broken into four parts; second with a very broad yellow band, much broadest laterally, and rather widely interrupted in the middle; third with a large transverse mark, notched below, on each side; fourth, the band entire but narrowed in the middle, and deeply notched behind at the sides; fifth with a large quadrate patch, emarginate in front; venter red, the hind margins of the segments broadly dark, one or two slightly indicated yellow dots. There is some resemblance in the colour and markings to *N. gracilis*, Cresson, known only in the male,* but I do not think it can be regarded as the female of that species. In Robertson's table it runs to *N. placida*, but is larger, and differs conspicuously in the abdominal markings. It is smaller than *N. electa*, and that species (*fide* Viereck) has the b. n. going far basad of t. m.; it also has some yellow on the legs. *N. electella* differs in the face-markings, tegulae, &c.

Hab. Glencarlyn, Virginia, October 10th (Nathan Banks).

Nomada infantula, sp. nov.

♀. Length about 5 mm.; red, with a broad black band on the mesothorax and metathorax; mandibles simple; a blackish spot be-

* I examined the type of *gracilis* in the Cresson collection. It is about 8 mm. long; legs red and black; thorax black without marks; anterior edge of clypeus, lower corners of face and spot on base of mandibles yellow; apical plate of abdomen notched; second segment with a very large yellow mark on each side, third with a narrow interrupted band, fourth with a pair of spots, fifth and sixth each with a spot.

tween antennæ, and a black transverse patch enclosing ocelli; antennæ entirely red, fourth joint longer than third, but shorter than twelfth; mesothorax rugoso-punctate; scutellum moderately elevated and bilobed; pleura with a black patch beneath; legs red, hind tarsi blackened on outer side; tegulae red; wings hyaline, the apex fuscous; stigma sepia-colour; b. n. some distance basad of t. m.; second s. m. broad, third narrowed almost to a point above; abdomen apparently without yellow spots, but close inspection shows a large very faint spot on each side of second segment, and small ones on third—these may be distinctly yellow and conspicuous in some specimens, perhaps; first segment with some blackish at sides of base; third infuscated apically; pygidial plate broad, pubescent; venter red, with only a dark mark on first segment.

♂. Length about 5 mm.; head and thorax black; a broad ferruginous band across lower part of face, including nearly all of clypeus, and sending a linear extension up the orbital margin, not quite as far as the antennæ; basal two-fifths of antennæ blackened behind; fourth joint conspicuously longer than third, and about or almost as long as last; joints four to seven with the apex somewhat projecting beneath, giving an imbricated appearance; tubercles ferruginous; pleura with much white hair; scutellum entirely black; hind femora and tibiae suffused with fuscous; basal two-thirds of first abdominal segment black or almost; apical plate notched.

By the small size this resembles *N. parva*, Rob., but it is distinguished in the female by the very feeble spotting of the abdomen, and more especially in the male by the structure of the antennæ, and the absence of yellow markings on the abdomen.

Hab. Great Falls, Virginia, May 22nd (Nathan Banks). The two specimens, one of each sex, are gummed on the same card.

Anthidium blanditum prædentatum, subsp. n.

♀. Similar to *A. blanditum*, Cresson, but differing as follows: upper part of clypeus with a large W-like black mark, consisting of a pair of cuneiform marks side by side, the points directed downwards; anterior edge of clypeus also black, and a small dark area in the middle just above the edge; interruption of band on top of head broad, greater than the interval between the lateral ocelli; axillæ as well as scutellum with yellow bands; no yellow spot beneath tubercles; the first four abdominal bands interrupted in middle, fifth only notched; laterally, the first band is notched behind, the second in front.

Known from *A. montivagum* and *A. porterae* by the bright lemon-yellow sixth abdominal segment, its margin evidently notched in the middle, and the elongated marks over the eyes.

Hab. Boulder, Colorado, June 22nd, 1906 (G. Hite).

Dianthidium pudicum (Cresson).

♀. Length about 8 mm.; strongly punctured; black with cream-coloured markings, no red colour anywhere on body or legs; ventral scopa pale orange; hair on inner side of tarsi pale orange; wings strongly dusky, especially the marginal cell.

Similar to *D. parvum*, Cresson, but the markings are paler; the clypeus has only a pair of small light spots, separated from the lateral face-marks by a narrow line of black; the tibiæ are black with only a light mark or spot at the base; the apical abdominal segment is entirely black, and the lateral part of the light marks on the fifth is wanting. The posterior notches of the light areas of segments two to four are large and strong.

Boulder, Colorado, September 19th, 1906 (S. A. Rohwer).

D. pudicum was based on two male specimens from Nevada, closely allied to *parvum*, but with cream-coloured markings. The female has not been described, but in the Cresson collection there are placed with *pudicum* two females from Colorado, with the abdominal bands yellow, and the clypeus with central part black. These, I think, do not belong there, and it is much more likely that the insect described above is the real female of *pudicum*. Whether it is more than a mutation of *D. parvum* is another matter.

University of Colorado, Boulder, Colorado:
March 26th, 1907.

A FEW NOTES ON SOME OF THE CORSICAN BUTTERFLIES.

BY MARGARET E. FOUNTAINE, F.E.S.

ALTHOUGH Corsica in recent years has become anything but a *terra incognita* to British entomologists, most Continental collectors having visited at some time or other the dry hillsides round Ajaccio, and the glorious forest of Vizzavona, I still hope, nevertheless, the following notes may obtain some little interest, for one reason that, during my stay there last summer, I visited more than one locality hitherto unexplored, at least by British entomologists; and also that my collecting in the island began several weeks earlier in the season than the time usually and indeed well chosen as being the most likely to be productive of good collecting; and of those who have waited till the end of June or even July before going to Corsica I can only say that they have acted wisely, as in May and early June, after a good series of *Anthocaris tagis* var. *insularis* is secured, there is but little to be done of much importance.

Luri (100 ft.), in Cap Corse, is, I think, the best place for spring collecting; and though the Hôtel de France is an inn of exceeding modesty, accommodation can be found there, but I can scarcely describe it as palatial, inasmuch as it boasts of but two tiny bedrooms, so that when these are both occupied, should a third guest arrive, the arrangement is that he sleeps on a sofa in the *salle-à-manger*. Evisa (2700 ft.), situated about 60 kil.

west of Corté, and about 70 kil. north of Ajaccio, is one of the most beautiful places I have ever seen, close to the borders of the great Forest of Aitone on one side, and on the other looking over chains of rugged mountains towards the sea and the sunset. Hôtel Gigli, too, being an inn of fair pretensions, clean and comfortable, with a most obliging proprietor, goes far to make a prolonged stay at Evisa exceedingly pleasant and agreeable. Then, too, a place little known to entomologists, but by no means unworthy of notice, is La Piana, built on a raised plateau, near the edge of a cliff, about 1400 ft. above sea-level, and close to the Calanche, a rocky formation of hard red sandstone, whose many weird forms and outlines would suggest having been wrought by the perpetual action of the sea in centuries gone by. These Calanche attract many French tourists to La Piana, in spite of the long diligence drive of some 60 kil. from Ajaccio.

I append a list of the most important amongst my captures, beginning with:—

Papilio hospiton, Gn.—My first capture of this rare and beautiful *Papilio* was on May 8th at Luri; four specimens were taken that day, but three of them were in bad condition, suggesting that their emergence from the chrysalis must have taken place some time in April. Yet I do not think that *hospiton* is double-brooded; specimens seem to emerge throughout May, June, and July, singly, and, according to my experience, by no means at frequent intervals. I only took it in one locality near Luri, on the top of the mountain pass, above Cagnano, and it was far from common. At Evisa it also occurred, but was decidedly rare. This butterfly seems to be unusually addicted to knocking itself about, so that by far the greater number of those taken were more or less damaged. The larva, when half-grown, is easily distinguishable from *machaon*, which, however, in its early stages it closely resembles; the black rings are more rugged in their outlines, and the general tone of the caterpillar more of an apple-green.

Anthocaris tagis var. *insularis*, Stgr.—The best place for this insect is undoubtedly Luri; I found three or four localities for it in that neighbourhood, in some of which the males were quite common. My first capture of it was on May 5th, on the pass below Seneca's Tower (950 ft.). It occurred also on the top of the pass above Cagnano (775 ft.), and on the southern slopes of the mountains near Luri, in which latter locality, with the able assistance of Bersa, I once took fourteen specimens in one morning. All these elevations were, at their highest points, just below 1000 ft. *Insularis* is a rapid flier, but, like var. *bellezina*, loves to settle on the pale mauve flowers of the wild rosemary, which much facilitates the chances of its capture. At Evisa in June it was rare, but still to be had in good condition. It was

practically over on a mountain south of La Piana at the end of
this month. My efforts to obtain ova, or to discover the larva,
of this ~~buttefly~~ were unfortunately unsuccessful.

Cerura xylosteana, S. V., and var. *corsica*. The type, with, however, three females, occurred commonly at Evisa and La Piana in June. Var. *corsica* was only taken by me on the very top of the Vercors (about 5000 ft.) in July, where it was extremely rare.

Charaxes jasius, L.—Along the steep rocky ridges, on the
sides of the arbutus-clothed mountains round La Piana, all
endured the searching heat of the midsummer days, *C. jasius*
rungs and gamboles with his fellows; and, indeed, much to their
own personal destruction do these summer idlers fight and frolic
in the sunshine, so that it was not until I had caught several,
and released as many, that I managed to secure three or four
excellent specimens in absolutely perfect condition. They
showed no fear, these brave glorious butterflies of the south;
they were angry, not frightened, when they found themselves
prisoners in the net, and if disqualified, and therefore released,
returned with just the same intrepid persistence to the very spot
where they had so recently escaped from such a pitiful tragedy.

Encyrtus articus var. *ichneusa*, Bon.—My first capture of this butterfly was on May 16th at Luri. In June at Evisa it was common, and there were any amount of larvae in all stages waiting on every kind of stinging-nettle. But I soon found to bring them home when full-fed was (at least in my first attempt) nearly to breed one hundred per cent. of ichneumons; whereas afterwards a batch of tiny ones produced just as many butterflies. I also induced some females to lay, which they did very readily, shortly after being placed in the sun with plenty of nettle to choose from. On one occasion a female, having deposited quite a large batch of eggs, began to get very lively, so removed her from that cage, where another female was busily laying at the same time; and the next day, having been well treated with sugar and water in the meantime, I put her back on the laying-cage again. She seemed very restless, and, though apparently wishing to lay, wandered anxiously about for nearly half an hour in search of a suitable spot, till at last she found what she was evidently looking for, i. e. the same batch of eggs she had already laid the day before, where she at once began laying again, very or less on the top of the others. I thought this all very curious as the eggs laid by the other female were never touched by her, though she once had a look at them, but would please her but to find her own. She was subse-

(cont.)—Appeared in great profusion in the
near Evisa, towards the end of June, and
the Col de Vergio.

A. paphia, L., var. *valezina*, Esp., and var. *anargyra*, Stgr.—All three occurred together in the Forest of Aitone in July.

A. pandora, S. V.—Very common at Evisa in July. The specimens were all dark, especially the females.

Satyrus semele var. *aristaeus*, Bon.—First taken at La Piana on June 23rd. It was very common at Calacuccia towards the end of July.

S. neomiris, Godt.—First taken at La Piana on June 24th, where it soon became fairly common on the "jasius-haunted" ridges of all the mountains. Also very abundant at Evisa (outside the forest), on the Col de Vergio, and at Calacuccia in Italy.

Pararge megæra var. *tigellius*, Bon.—Met with throughout the summer everywhere. Apparently the only butterfly to be had during my first few days at Luri in May. I took a very fine female near Bastia on May 24th, in which the black apical spot on the fore wings was fully twice the normal size.

Cænonymphia corinna, Hüb.—Was rather rare at Luri in May. Very common at Evisa and La Piana in June and July.

Syrichthus sao var. *therapne*, Rbr.—Taken first at Luri on May 9th, where, however, it was very rare. Also at Corté end of May. I do not recollect seeing it at all either at Evisa or La Piana. A brood emerged on July 25th at Calacuccia, so that I was just able to secure a few specimens before I left.

Milano : March 15th, 1907.

A RECORD EVENING AT THE ELECTRIC LIGHTS IN DURBAN, NATAL.

By GEO. F. LEIGH, F.E.S.

I HAVE collected moths, &c., at the lights in Durban on and off for the past seven years; also in England, a good many years ago, in Shepherd's Bush Road, and, although I have frequently seen a great number, still the record for March 15th, 1907, is far and away above anything I have yet experienced.

The evening was very still and close, and there was a little lightning. I arrived at the Umbilo Road, about a mile and a half from the centre of the town, at about 7.45 p.m., and worked three arc lights. There were of different orders of insects simply thousands flying around each lamp. The ground below was covered, and also a wall near one of the lights. I give below a list of the moths taken, as far as I can, several being quite new to me, and, as I do not know the family they belong to, I must omit these.

Saturnidæ very few, only two examples of *Bunæa tyrrhenæ*, one worn *Capaxa flavinata*, one *Ludia delagorguei*, and two *Urota sinope* turning up.

Sphingidæ were exceedingly plentiful almost throughout the evening, and I took the following :—*Chærocampa eson* (2), *C. capensis* (3), *C. celerio* (4), *Phlegethonotius fulvinotata* (2), *Polyptychus grayi* (1), *P. postica* (3), *B. meda* (5), *Euchloron megæra* (1), *Nephele accentifera* (1), *Andriasa mutata* (one male), and *Temnora marginata* (2); *Sphinx convolvuli* gathered in great numbers, and many were run over on the ground by carts, rickshas, &c.

Of the Geometridæ very few occurred that I am able to identify, these moths not being named yet. I took, however, a banded variety of *Boarmia accaciaria*, and saw two or three others; also three specimens of *B. proximaria*.

The Noctuidæ simply swarmed, and a few rare ones were obtained. I captured one specimen of the scarce *Spiramiopsis corunna*, and am sending this to the Entomological Society of London, as I had previously sent them a blown specimen of the extraordinary larvæ of the species. *Plusia angulum* (many), *P. signata* (2), *P. oxygramma* (3), *P. chrysitis*, *P. chalcites* (2), *Leucania loreyi* (1), *L. infima* (3), *Serrodes inaria* (7), *Amyna selenampha* (1), *Ophiusa indeterminata* (2), *O. limbata* (1), *O. algira* (1), *O. echo* (2), *Agrotis segetum* (1), *A. muscosa* (1, and two vars. of same), *Chalciope stolida* (5), *C. hyppasia* (4), *Thermesia atriplaga* (2), *T. irrorata* (1), *Bereia incedens* (1), *Entomogramma pardus* (3), and *Cyogramma latona* (2). Other species taken were *Diacrisia leinardi* (2), *D. lutescens* (4), *D. flava* (1), *Rigema ornata* (1), *Metarctia lateritia* (2), *M. rufescens* (four of the black variety, type-form very common), *Anthena simplex* (1), *A. tricolor* (3), *Duomitus capensis* (2), *Euproctis fasciata* (1), *E. pallida* (2), *Rhodogastria lupia* (one, rare), *R. astreas* swarmed (took two or three of the dark variety), *Maurilia arcuata* (2).

The following butterflies also turned up, which, with the exception of the first-named, is very unusual indeed: *Melanitis leda* (2), *Myrina dermoptera* (a very fine female), *Papilio demoleus* (1), *Crenis boisduvali* (1), *Charaxes verannes* (one, damaged).

As I am now working hard at the Micros out here, I took in all about thirty different species; they were about in thousands, and I am glad at last to be able to get these properly attended to and named.

In conclusion, I may also state that there were hundreds of grasshoppers, locusts, &c., dashing about, and several beetles. I took six different species of water-beetles and some of the very large water-bugs, also on the wing. Altogether it certainly was a sight I should have been sorry to have missed. The bats, too, that are generally on the wing all the evening, disappeared soon after 8 p.m. I conclude they had had a good meal by that time. Strange to say, on the previous evening, with about the same weather, there was scarcely an insect to be seen.

Durban: March 16th, 1907.

NOTES ON LEPIDOPTERA AND COLEOPTERA
CAPTURED IN 1906.

By H. F. & J. C. F. FRYER.

IN Cambridgeshire and Huntingdonshire the year 1906 was a successful one from a collector's point of view, but very little of genuine scientific value can be recorded.

In the Rhopalocera three species of *Thecla* were bred, viz., *T. pruni*, *betulae*, and *quercus*, the two latter being abundant and easily reared. *Augiades (P.) comma* was taken on the Devil's Dyke the third week in August, and also one specimen of *Cupido minima*, which, we presume, would be the second brood.

In the Heterocera *Hylophila quercana* was recorded for the first time from our part of the Isle of Ely. *Leucoma salicis* seems on the increase, after being scarce for many years.

Noctuæ were not so plentiful as in 1905, but the quality was quite as good. *Cymatophora ocularis* turned up in some numbers at sugar, especially on white poplar, though occurring singly in most other situations as well. *Acronycta strigosa* again occurred, but only once, at sugar. A fine variety of *A. ligustri* was taken, resembling var. *coronula*, but without any light markings. Reed-feeding species were scarce, especially *Leucania straminea* and *Senta ulvæ*, though *Calamia lutosa* in October was not uncommon. *Xylophasia sublustris* in June was a new record for the district.

In Mid Devon one *Laphyga exigua* was taken at light, but on account of illness little collecting was done in this county.

An attempt was made to observe the relative numbers of *Miana strigilis* and its variety *aethiops*. The insects on a single round of about one dozen sugared posts were counted. The result was inconclusive, the numbers varying to too great an extent from night to night. On the whole, *aethiops* was in excess, about seventy per cent. being this variety.

Three specimens of the var. *bilinea* of *Grammesia trilinea* were taken. *Agrotis rufida* was again uncommon, only three specimens being noticed. *Tæniocampa opima* and *T. populeti* occurred at sallows, but only singly. One perfect *Dicycla oo* was captured at sugar in July, in the fen, at least six miles from the nearest oak wood, where we have never yet found the species. One specimen of *Asteroscopus sphinx* was bred from larva beaten in May. *Bankia argentula* was common at Chippenham in June. This closes the list of *Noctuæ*, though all the regular species noticed in former years occurred as well.

In the Geometrae *Amphidasys betularia* var. *doubledayaria* was bred, being the first specimen observed in the district, although this species has been bred occasionally for a period of forty years.

One of the catches of the season was a specimen of *Sterrha sacraria*, taken while out shooting in Cambs. It is a male in

fine condition, and was taken flying in the sunshine in a marshy meadow.

Among the Pyralides *Perinephele lancealis* was the only fresh record. In the "Knothorns" *Euzophera pinguis* and *Cryptoblabes bistriga* were new to the district.

Tortrices were very disappointing, one specimen of *Stigmonota trauniana*, bred from maple bark, being the only notable occurrence.

No mention is made above of *Macrogaster arundinis*, *Lithosia muscerda*, *Tapinostola elymi*, *Nonagria brevilinea*, and *Hydrilla palustris*, taken in expeditions to Wicken and the Norfolk Broads, as these will probably be referred to in another note.

COLEOPTERA IN THE CHATTERIS DISTRICT IN 1906.

During the three years 1879-81, the first-named writer collected beetles somewhat assiduously, and then left them, mainly owing to the difficulty of identification—for Fowler's 'British Coleoptera' was not then within reach.

After twenty-five years' more or less desultory work among Lepidoptera—the last ten with the assistance of my son, J. C. F. Fryer—we came to the conclusion that not very much remained to be done in the immediate district as regards the mere addition of species. In January, 1906, I looked up my old collection of Coleoptera, and found with disgust how much one can forget in twenty-five years.

During the last year we have taken some three hundred species within the limits of the "district," and we give below a few notes of the more interesting species. Although the characteristics of this district have been referred to several times in our notes on Lepidoptera, it may be as well in this first note on the Coleoptera to repeat that it is comprised roughly within a radius of twelve miles of the town of Chatteris, and consists of both "highland," *i. e.*, land with a subsoil of the older geological formations, and cultivated fenland, of which the subsoil is partly estuarine and partly lacustrine in origin. Its nearness—some thirty miles—to the sandy coast of The Wash, with which it is in direct communication by means of the river systems and artificial "cuts," may account for the occurrence of some coast species.

There are also two small woods and a very small portion of original fen, neither of which, however, has at present been worked to any extent, and the occurrence of such forms as *Haploclnemus nigricornis*, *Cistela ceramboides*, and *Tillus elongata* is curious.

Anchomenus livens.—Several specimens in 1906.

Philonthus decorus.—The same.

Stenus opticus.—One specimen.

Dacne humeralis.—Local, but occurring in some numbers in dry fungoid growth.

Triplax russica.—Three specimens in 1881. I have not seen it since.

Omosita depressa.—Taken about 1880, and also in 1906.

Nemosoma elongata.—In the burrows of *Hylesinus*, under elm-bark of an old fence in 1906, a locality from which it has since utterly disappeared.

Tiresias serra.—Bred from larvae taken from under bark of elm, willow, and maple. Common in the district.

Tetratoma fungorum.—One specimen, evidently some time defunct, in an old dried fungus.

Ægialia arenaria.—One specimen. Fowler says: "Sandy coasts . . . apparently generally distributed round the coasts of the whole kingdom."

Trox sabulosus.—Another species one did not expect to take here.

Silis ruficollis.—One specimen at Chatteris and one at Wicken.

Haplocnemus nigricornis.—A single specimen of this rare insect was taken in the district in 1906, but as it was not identified until some little time afterwards the exact locality was unfortunately not noted.

Tillus elongata.—A single specimen.

Opilo mollis.—Several specimens from one locality, on or near *Populus alba*.

Cistela cerambooides.—One example.

Mordella fasciata.—Not uncommon.

Brachytarsus fasciatus.—Occurs under bark of maple.

Ceuthorhynchus viduatus.—A few specimens by sweeping.

We are very much indebted to Dr. D. Sharp and Mr. C. R. Billups, of East Grinstead, for help in identifying species, and to the latter for many valuable hints as to the species to be looked for in the district.

The Priory, Chatteris.

NOTES AND OBSERVATIONS.

HYPSA BAUMANNIANA AND H. CONSPICUA UNDOUBTEDLY VARIETIES OF H. SUBRETRACTA.—Referring to the notes on the above in the February number of the 'Entomologist,' by my friend Mr. Berensberg, I can confidently state that *H. baumanniana* and *H. conspicua* are only varieties of *Hypsa subretracta*. I have reared this species during each of the last five years, and in every instance have obtained the three forms, and also other varieties. All three forms have been bred, and sent by me to the Tring Museum, and also, I believe, one example with the band on one hind wing only. With me the var. *conspicua* has been the rarest, the var. *baumanniana* common, and the slightly banded form the commonest next to the type. I have, however, only bred one *conspicua* male. As far as I can remember, the other specimens of this form have been females. I may also mention that the larvae do not vary in the least, and the species is one of the commonest in Durban.—G. F. LEIGH, F.E.S., Durban, March 9th, 1907.

PIERIS NAPI VAR. BRYONIAE MALE?—The specimen of var. *bryoniae*, believed to be a male, and shown as such at the February meeting of the Entomological Society, I submitted to the examination of Dr. Chapman, who declares it to be only a female after all. In such a matter his decision is indisputable. I shall be obliged therefore if you will

Allow me to add my expression of regret at the mistake.—F. S. LOWE.

INSECT FAUNA OF LINCOLNSHIRE.—I shall be very much obliged to the readers of the 'Entomologist' and other naturalists who can supply me with a list of any order of insects taken by themselves or their friends in Lincolnshire, to help me in completing the insect lists for the 'County History of Lincolnshire.' Notes upon the commoner species will be acceptable. I may say, too, that the Lincolnshire Naturalists' Union is now publishing lists from the notes kept by me as the Entomological Branch Secretary, so that I shall be anxious at any time to hear from any one who collects in the county.

J. W. NICHOLSON: Burton-on-Humber.

INSECT FAUNA OF YORKSHIRE.—Another important addition to existing faunal lists is that contained in the Victoria History of the County of Yorkshire. The insect section has been edited by Mr. G. T. Dyer, who also prepared the lists of Orthoptera, Neuroptera, Trichoptera and Lepidoptera. The list of Hymenoptera is by Mr. W. D. Buckland, that of Coleoptera by Messrs. E. G. Bafford and M. L. Thompson, and Mr. F. H. Grimshaw has drawn up the list of Diptera. Mr. Dyer states that the lists of Neuroptera and Trichoptera are largely based on the result of his own work during the past twenty years. The summary of these show that of the 71 British species of Neuroptera (excluding Psocidae and Ephemeridae), 37 occur in Yorkshire, 38 of the 33 British species referable to Planipennia; and of the 167 British species of Trichoptera are found in the county. The Lepidoptera total something over 4000, but in Yorkshire only 100 species are so far known to occur; and of the 3276 species of Coleoptera recorded to Britain, 1707 species have been observed. Lepidoptera is the order of insects most in favour almost everywhere, and this is especially the case in Yorkshire; anyway, from the material at hand for the county we find that 1884 of the 2140 named species have been recorded.

EXCHANGE AND INFORMATION BUREAU FOR LEPIDOPTERISTS.—The chief difficulty experienced by British collectors, when they leave their insularity, and seek "fresh woods and pastures" abroad, generally is to get at the right sort of information regarding localities. There are, of course, in France and elsewhere, hitherto "centres" which are as well known and visited as the New Forest and Wicken Fen, and have been visited by collectors since their discovery perhaps a half-century ago. The knowledge of adjoining regions is as incomplete as ever, and the address of any number of French lepidopterists will not help advanced scientific work in their periodicals, which has reached me from M. le Docteur J. J. Deneau, Officier de l'Instruction Publique, of the Chambre de Commerce de Royan, Charente-Inférieure, of an "International Exchange and Information Bureau for Lepidopterists," having no permanent staff but offering collectors at once the advantages of a central depot and facilities for exchanging specimens.

Should the venture prove successful—and I cordially recommend it to the notice of collectors on this side of the Channel—it is intended to collate and publish lists of the insects furnished, in the course of correspondence and exchange, by individual collectors from their respective localities, and in this way to arrive at a more precise knowledge of the distribution of species throughout France—a great part of which, so far as I have been able to find out during several years of research, is from the lepidopterist's point of view wholly unknown and unexplored. The gentlemen whose names I have mentioned will send full particulars on application, and these also comprise a list of all the Macros occurring in the neighbourhood of their beautiful town. Meanwhile, may I again ask any entomologists who may be visiting France during the coming season, kindly to let me have a list, with dates, of the butterflies (only) taken or observed by them?—H. Rowland-Brown; Oxhey Grove, Harrow Weald, April 21st, 1907.

BARRETT'S 'LEPIDOPTERA OF THE BRITISH ISLANDS.'—Mr. Adkin's cold douche has happily come too late to do much, if any, damage to the excellent work of Mr. Barrett, which will not be superseded during the present century. In compiling the index, we followed the author's own plan in his indexes to the separate volumes. Some one proposed to give the authorities for the names in the index. After due consideration, we came to the conclusion that this, which would greatly increase the bulk of the index and double the cost, would answer no useful end. The purport of an index is, not to repeat details given in the body of the work where all the authorities are given, but to direct to the page where they may be found. No suggestion was made concerning a specific index, which does not occur in any of our other works, where the indexes were prepared by the authors themselves, and it did not occur to us. We see at once the difficulty, not noticeable in the single volumes, where the indexes are short—the inconvenience of seeking the name of a species through forty-six closely printed columns. We therefore at once put in hand the compilation of an alphabetical index to the whole of the species, which will be issued as soon as ready.—THE PUBLISHERS.

COMPSOTATA, n. nom., pro *CHARIDEA*, Guen., Hmpsn., nec Dalman.—There is some confusion in the "nomenclators" respecting the generic name *Charidea*—particularly in Scudder's, which is the most generally consulted. As Zeller, in Agassiz (Lep., p. 15), correctly indicates, the name was first used by Dalman in 1816 (Vet. Ak. Handl., xxxvii. p. 225) as n. nom. for *Glaucopis*, Fabr., Latr. (nom. præocc.—non Gmel. nec *Lacépède*). *Charidea*, Guen. (Spéc. Gén. vi. [=Noct. ii.] p. 60, 1852) is also rightly cited by Marschall (p. 283); but he adds *Charidea*, Dalm., 1846 (*ex err.* for 1816), meaning to imply that Guenée's name is preoccupied, and this has resulted in Scudder's citing (Univ. Index, p. 65) "*Charidea*, Guen., 1846," while he leaves "*Charidea*, Dalm." without a date. Sir George Hampson, in his new volume (Cat. Lep. Phal., vi. p. 140) has accepted Guenée's use of the name as valid, restricting the genus to its type-species *elegantissima*, Guen. For this genus I propose the new name *Compsotata*, mihi, n. nom.=*Charidea*, Guen., Hmpsn. restr. nec Dalman, type *elegantissima*, Guen.—LOUIS B. PROUT; 246, Richmond Road, N.E., March 23rd, 1907.

CAPTURES AND FIELD REPORTS.

VANESSA ATALANTA.—During the first three weeks of February, 1907, *V. atalanta* made its appearance several times in a school-yard here. It flew vigorously during what sunshine there was, and kept to the sunny side of walls, opening and closing its wings while basking. This insect disappeared during a spell of frosty weather, and its retreat could not be discovered. On December 2nd, 1906, I saw *V. atalanta* several times, and again, on December 15th, I saw a specimen fly over a cliff-side.—G. RANDELL; Seacombe, The Parade, Barry, Glamorganshire.

BLATTA ORIENTALIS OUT OF DOORS.—Mr. W. Daws, of Mansfield, tells me that on March 29th, 1907, he took a female *B. orientalis* in a garden at a distance from any house, in a heap of garden refuse. It was very stupefied, and did not attempt to escape.—W. J. LUCAS; 28, Knights Park, Kingston-on-Thames.

VARIETY OF *BREPHOS PARTHENIAS*.—While collecting at Easter in Epping Forest, I was pleased to obtain a very pale straw-coloured example of *B. parthenias*, this being the first one I have seen of that colour.—C. H. WILLIAMS; 36, Dartmouth Street, S.W.

NOTES FROM THE NORTH-WEST FOR 1906.—My first field day was on February 17th, the locality Delamere Forest. The purpose of the visit was to see if the scarcity of *Hybernia leucophæaria*, so noticeable in my experience since February and March, 1892, was still maintained. It was, for I only saw one moth, a male *H. marginaria* = *progemmaria*. The same lament applies to other spring Delamere species, as *Nyssia hispidaria* (which I have not seen since March, 1901) and *Anisopteryx ascularia*. *Phigalia pedaria* = *pilosaria* is about the only moth now which keeps up the ancient spring reputation of Delamere Forest. And this evident scarcity is not explained by tree-felling, for the scene of my observations on February 17th was the same as that of February 18th, 1892, when I picked off the oak trunks a long series of *H. leucophæaria*, including many melanic specimens. Nor has the scene, I believe, lost a single tree since then. I have taken melanic females of *P. pedaria* in Delamere Forest, but the only melanic male (almost black and unicolorous) I possess I captured at a Chester gas lamp. The unicolorous melanic form of *H. marginaria* is not only frequent at Delamere but throughout the Chester district.

I have little worthy of special record until I come to the month of June. That pretty silvery-white geometer, *Lobophora lobulata*, with its distinctive transverse lines, was common in the Forest in the month of April. At the Chester electric lamps I took a fresh and fine *Tæniocampa opima* in the same month (April 22nd). This species is only recorded in our district list for Wallasey and Llandudno; therefore my capture supplies a missing geographical link. About the middle of May I obtained two fine melanic specimens—almost black—of *Tephrosia biundularia* at Delamere. In fact, the Chester district can fairly claim to be a melanic centre. I do not remember such a June for low temperature and absence of bright sunlight. Occasionally

there was a warm, sunny day, as on the 9th, when, in Delamere Forest, among other things I captured a worn *Ephyra punctaria*. On the 10th a fine example of this moth emerged in a breeding-cage from a larva beaten off an oak in the Forest, October 26th, 1905. *Lycæna ægon* was just appearing in its usual haunts at Delamere on the 30th. On July 14th the butterfly was plentiful and in fine condition. At sunset I could have taken scores as they rested, head downwards, on an unusually prominent furze bush. Some of the females were beautifully "shot" with blue, particularly on the lower wings, the nervules marked out in black. A few of the females had the marginal red spots almost obliterated, whilst one specimen is a unicolorous black, relieved only by a few scanty blue hairs in the region of the thorax. Five *Cænonymphia typhon (davus)* var. *philoxenus*—*rothliebi* were seen, June 30th, and eight only were counted on July 14th, on the principal ground where the butterfly was plentiful a few years ago. The diminished numbers are doubtless due to over-collecting, and the time seems close at hand when *typhon* will cease to appear among the records of Delamere. *Hepialus hectus*, fine and fresh, were flying in numbers over isolated spots in the forest clad with bracken (the food plant) on July 21st from 8.30 to 8.45 p.m. In some of the specimens the silvery spots on the upper wings are unusually numerous and conspicuously large. The captures included only one female—a very sober-coloured moth in comparison with the males.

It is remarkable that *Coremia ferrugata* should be common in Denbighshire and comparatively scarce in the Chester district. The Cheshire specimens are larger than those of Denbighshire, and the transverse central reddish bar across the upper wings is disproportionately broader. *Numeria pulveraria* is a moth I have never taken in Cheshire, but several specimens were captured in June in the Wrexham-Llangollen district (Denbighshire) by Mr. B. Thompson. Especially when reared from the egg, *pulveraria*, with its umber ground (upper wings) crossed by a wide, transverse dark bar, is one of the most striking of British geometers. In closing my notes on North Wales I ought to mention that dingy skipper *Nisoniades (Thanaos) tages*, which was fairly common in June in its Flint and Denbigh haunts. Mr. B. Thompson found *L. argiolus* plentiful in May near Wrexham (Denbighshire), but I failed to meet with a second brood in August. The butterfly, therefore, appears here to be single-brooded.

At the Chester electric lamps frequent windy nights and low temperatures interfered with collecting in June and July. Still, a beginner could have made some welcome captures. Among these, in June, were *Smerinthus ocellatus*, *S. populi*, *Dicranura bifida*, *Notodontia ziczac*, *Miana strigilis* (melanic forms culminating in the var. *aethiops*), *Xylophasia hepatica*, *Hadena thalassina*, *Habrostola triplasia*, *Amphidasya betularia* (plentiful, but including only a couple of types), and *Schænobius forficellus*; in July, *N. dictæa* (*N. dictæoides* appeared as early as May 27th), *Acronycta leporina*, *Caradrina morpheus*, *C. alsines*, *C. blanda*, *Plusia chrysitis*, *P. iota*, *P. pulchrina*, another type *betularia*, and melanic forms of *Tortrix podana*, the latter probably reared on the elms near by. *Spilosoma menthastræ* was unusually abundant in June and July at the lamps. On the other hand, I found *S. lubricipeda* much less in evidence. I took a female *S. menthastræ* on the night of

June 11th. She laid a large number of eggs, which hatched in a fairly warm kitchen on the 18th. The larvæ-fed on plantain, and from which I hoped to get melanic forms—all began, unexpectedly, to pupate on July 14th, when I happened to be from home; and, as they suffered in the change from want of space, they died in the pupa state, except a solitary crippled and typical imago which emerged July 31st. Other forcing operations, in the same room, with *Nemeophila plantaginis* were more successful. Mr. J. Thompson kindly gave me about seventy eggs from the usual May-June brood. The parents were reared from larvæ taken in 1905 on Minera Mountain, Denbighshire. The eggs given me hatched June 29th and 30th, and the larvæ, fed on plantain, spun up on various dates in August. The first imago—a fine female—appeared August 21st and the last on December 8th. Every egg, I believe, resulted in a moth at some time or other between these dates. There was only a single departure from the typical insect—a male, in which the black markings were unusually and largely developed. I noticed, in forcing this second brood of *plantaginis*, that, as the outside temperature of the season fell, the emergence from the pupæ became less frequent and the larvæ were slower in spinning up. Larvæ, pupæ, and perfect insects, consequently, occurred together, even in November. I have seen the same results when forcing second broods of *Arctia caia*. Before leaving my captures at the electric lamps, I may mention a melanic specimen of *Phibalapteryx lignata* = *vittata* (August 23rd), *Anchocelis lunosa* (plentiful at the end of August and beginning of September), *Xanthia xerampelina* (August 31st), and, in September, *Epunda lutulenta*, *Tapinostola fulva* (with red forms), *X. silago*, *X. gilvago*, *Eugonia (Ennomos) tiliaria*, and *E. fuscantaria*. Among the numerous males a solitary female *E. tiliaria* turned up on the night of September 12th, from which I obtained a lot of fertile eggs.

Fine sunny days marked the beginning of August until the 8th, when I went for a fortnight's stay to Lancaster. The temperature began to drop until the 10th, when, as I have so frequently observed, there is—or about that date, and on towards the middle of the month—an unmistakable break-up of the weather. In this case, stormy south-west winds, with frequent heavy rains, continued until the 14th, when, the sun shining once more, I went for a day's collecting on Arnside Knott. The following butterflies were observed:—*Argynnis aglaja* (in good condition), *A. adippe* (so battered as to be hardly recognizable), *Erebia athiops* = *blandina* (chiefly worn and chipped by the recent weather), *Satyrus semele*, *Epinephele ianira*, *Thecla quercus*, *Cæonymphæ pamphilus*, *Lycæna astrarche* var. *salmacis*, but nearly all bearing traces of age or of stormy weather. Other captures were *Cosmia trapezina* (at rest, and including the reddish form), one green and one almost black *Hypsipetes elutata*, *Crambus hortuellus*, and *C. inquinatellus*. Larvæ of *Cucullia asteris*—a species new to Mr. Forsythe's district list (Entom., xxxviii., p. 86)—were taken off flower-heads of golden-rod. Seeing a thunderstorm coming up from the south-west about midday, my companion and I worked on until we barely gave ourselves time to reach the foot of the knott, or hill, where, in some friendly stables, we spent the time until the storm was over in admiring the carriage-horses, &c.—things getting rarer and rarer in these days of motor cars! The storm over—and a fierce one

it was—we adjourned to the Crown Hotel, Arnside, which, after a good feed, we left again, and returned, with the sun shining once more, to our hunting-ground on the knott. Another visit, on the 16th, turned out to be on a cool, showery day, with north-west winds. I saw a few *blandina* and *T. quercus*, but the season was about over for the butterflies. Off tree-trunks I picked a worn and unrecognizable *Eupithecia*, an equally worn *Scoparia*, and, off a fern, a fine example of *Tortrix forskaleana* in which the median fuscous blotch (upper wings) is much more developed than in our Chester specimens. On this occasion I again took larvæ (three) of *C. asteris* from golden-rod.

In the immediate vicinity of Lancaster I noticed the following moths:—*Bryophila perla*, *Polia chi* (at rest on stone walls), and, on tree-trunks, the pale form of *Cidaria truncata-russata*, that is, with the central portion of the upper wings white—the true *russata*, I believe. When I got home, on August 22nd, I found the smoke-coloured form of the moth about Chester (*perfusata*), and, at Delamere, the form *immanata*, that is, with the central and basal portions of the wing black-brown and the intervening transverse band distinctly brown. All these and subsequent forms I look upon as the same species, differing only as to times of appearance (*perfusata*, for example, appears twice in the season at Chester), difference in coloration and situations. To continue the list of "forms" I adopt for cabinet purposes I would cite *comma-notata*, with the upper wings centrally suffused with russet, and *marmorata* (brown markings only, on a whitish-grey ground), the latter leading closely up, in general appearance, to *Cidaria suffumata*. Before leaving my list of insects for the Lancaster district, I ought to mention a handsome form, hitherto entirely unheard of by me, of *Gonoptynx rhamni*, which that veteran entomologist, Mr. G. Loxham, showed me—a male with the tips of the upper wings broadly and clearly marked off with orange-scarlet. Mr. Loxham informed me this was a very local race of the butterfly, and that all the specimens captured in the locality were not always so definitely orange-tipped. Here I would express my warmest thanks to Mr. Loxham and to Mr. C. H. Forsythe for the kindness and help they extended to me while at Lancaster. Among the many favours received at the hands of Mr. Forsythe was a good look at his fine collection.

But my chief points of interest at Lancaster were, first, what was the form, there, of *Aplecta nebulosa*? and, secondly, the forms of *Boarmia repandata* and *B. rhomboidaria*? I found that a longitudinal line for the three species, drawn from South Wales, through Chester, on to Lancaster, and continued northwards, crossed the melanic centre in Cheshire, that north and south of Cheshire the moths became paler. Progressive melanism in these species appears to extend from this centre eastwardly. The same remarks apply to *A. betularia*, black forms of which have been taken near Berlin, only that this melanic direction now occupies a band, or zone, which, in the case of *A. betularia*, appears to have covered the greater part of Britain within the last fifty years.

In conclusion, I may refer to the abnormally hot weather of 1906 from August 22nd till the end of the first week in September, con-

ferring upon August the distinction of being the hottest for twenty-two years. On September 1st the temperature in England was declared to be "hotter than at the Azores." It was too hot in the daytime for collecting, and I contented myself with searching for well-marked females of the butterfly *L. icarus-alexis* (last brood), in a well-known haunt—but about six o'clock, p.m., after the sun went down. This was an easy matter, for the butterflies were at rest on withered grass and flower-heads, and, as in the case of *L. agon*, all head downwards.—J. ARKLE; Chester.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 6th, 1907.*—Mr. C. O. Waterhouse, President, in the chair.—Mr. John C. Moulton, of The Hall, Bradford-on-Avon, Wilts.; Mr. W. Schmassman, of 2, Kinnoul Villas, Freezywater, Waltham Cross; and Mr. R. J. Tillyard, B.A., The Grammar School, Sydney, New South Wales, were elected Fellows of the Society.—The President proposed the following resolution, seconded by Professor E. B. Poulton, D.Sc., F.R.S., &c.: "That this Society, being informed that a proposal has been made that children in our schools be instructed to collect objects of Natural History for the purpose of exchanging them for similar objects collected by school-children in our Colonies, deprecates the adoption of any such system." After a discussion, in which the destructive and fatal results to our national fauna of indiscriminate collecting by inexperienced persons was commented upon, the resolution was adopted unanimously.—Professor E. B. Poulton, F.R.S., exhibited male specimens of the Danaine butterflies, *Amauris egialea*, Cram., and *Limnas chrysippus*, collected at Ibidan, near Lagos. The interest of the specimens lay in the fact that the scent-producing patch near the anal angle of the hind wing had been eaten out on both sides, although only a minute portion of any other part of the wing-surface had been attacked, the facts appearing thus to tell strongly against the view that specially protective (aposematic) substances are, as some have supposed, concentrated in the male scent-glands.—Dr. F. Dixey, specimens of *Teracolus achine*, Cram., and *Belenois severina*, Cram., bred and captured at Salisbury, Mashonaland, by Mr. G. A. K. Marshall. The exhibit showed that in both species the appearance of the wet-season phase could be induced under artificial conditions in a brood that should normally have belonged to the dry-season form. The specimens of *B. severina* also exemplified the effect of moisture alone as contrasted with moisture and heat.—Mr. Selwyn Image brought for exhibition an aberration of *Odezia atrata*, L., taken by Dr. G. B. Longstaff at Morte-hoe, North Devon, on June 26th, 1906. The specimen differed very obviously from the ordinary form. The forewings were rather sharply angulated at the apex instead of rounded, and the colouring generally suggested a tendency to albinism.—Mr. W. J. Kaye exhibited a series of the genus *Heliconius*, arranged to illustrate Riffarth's division of the group by a secondary sexual character, a result of this being the discovery that what had hitherto been regarded as a

single species consisted in reality of two.—Mr. W. E. Sharp showed a small collection of Coleoptera intended to illustrate the tendency of some species to micromorphism, and gave an account of the causes of which these small forms were the result.—Mr. H. St. John Donisthorpe also exhibited, in further illustration of this characteristic, a number of similarly stunted specimens.—Mr. Hamilton Druce, a case of butterflies illustrating the interesting Lycaenid genus *Mimacraea*, including two groups, the one mimicking the Danaine butterflies, the other the Achraenae.—The Rev. G. A. Crawshay, M.A., read a paper, illustrated by lantern slides, on "The Life History of *Tetropium gabrieli*, Weise"; Dr. T. A. Chapman, M.D., F.Z.S., read a paper, illustrated by several exhibits, on "Some Teratological Specimens"; he also, with Mr. G. C. Champion, F.Z.S., communicated a paper on "Entomology in North West Spain"; Mr. Robert Shelford, M.A., F.L.S., a paper on "The Larva of *Collyris emarginatus*, Dej."; Mr. Malcolm Burr, B.A., F.L.S., "A Preliminary Revision of the Forficulidae and Chelisochidae"; Mr. Hamilton H. Druce, F.Z.S., "Descriptions of some New Butterflies from Tropical Africa"; and Mr. Arthur M. Lea, F.E.S., "A Catalogue of the Australian and Tasmanian Byrrhidae, with Descriptions of New Species."

Wednesday, March 20th.—The President in the chair.—Dr. Ernest Edward Octavius Croft, of 28, Hyde Terrace, Leeds; Mr. Felix M. Dames, of Berlin, W.; Mr. Thomas Frank Partridge Hoar, of Quex Lodge, West End Lane, Hampstead, N.W.; Professor Dr. A. Jacobi, Director of Zoology and Anthropology in the Ethnographical Museum of Dresden; and Mr. Harold J. White, of 42, Nevern Square, Kensington, S.W., were elected Fellows of the Society.—It was announced that the Rev. F. D. Morice, M.A., and Professor E. B. Poulton, D.Sc., M.A., F.R.S., would represent the Society at the forthcoming celebrations at Upsala and Stockholm.—Dr. F. A. Dixey exhibited several species of *Phrissura* and *Mylothris*, illustrating the remarkable parallelism between different forms of the two genera, a correspondence believed by the exhibitor to have a mimetic significance, the mimicry being probably of the Müllerian kind.—The following papers were communicated:—"Studies in the Tetriginæ (Orthoptera) in the Oxford Museum," by Joseph L. Hancock, M.D., F.E.S.; "A List of the Coleoptera of the Maltese Islands," by Malcolm Cameron, M.B., R.N., and Dr. A. Camara Gatto; "The Life History of *Spindasis lohita*, Horsf.", by John C. Kershaw; "On the Egg Cases and Early Stages of some South-Chinese Cassididae," by John C. Kershaw and Frederick Muir; "A Life History of *Tessaratoma papillosa*, Thunb.", by John C. Kershaw, with "Notes on the Stridulating Organ and Stink Glands," by Frederick Muir; "The Vinegar Fly (*Drosophila funebris*)," by Ernest E. Unwin, communicated by Professor L. C. Miall, F.R.S.; "On the Structure and Life History of the Holly Fly," by Professor Louis Compton Miall, F.R.S., and T. H. Taylor; "A Note on *Xanthorrhoea ferrugata*, Clerck, and the Mendelian Hypothesis," by Leonard Doncaster, M.A., F.E.S.

Wednesday, April 10th.—The President in the chair.—Mr. Sydney R. Ashby, of 119, Greenvale Road, Eltham Park, Kent; Mr. Arthur Bulleid, F.S.A., of The Old Vicarage, Midsomer Norton, Somerset;

Dr. Edmund H. O. Garrison, of Claremont, Ashleigh Road, Barnstaple; and Mr. Charles Steadling Johnson, of Mayfield, Binnington Crescent, Newcastle, were elected Fellows of the Society.—Dr. F. A. Dixey exhibited specimens of Pierine belonging to the genera *Tetralobus* and *Teratophyllum*. The exhibit was intended to illustrate the fact that in species in which the wet-season phases were very distinct from the dry, the corresponding dry-season phases often could only be distinguished with difficulty.—Mr. G. C. Champion showed, on behalf of Mr. J. S. Bingham, five forms of *Oospila*, together with certain other species occurring at the same time and place, and which, having regard to color and appearance, resemble them more or less closely. It was suggested that these resemblances are protective. Attention was drawn to an important function of the hind legs of the male, namely, to secure him in position at the time of pairing.—Mr. H. J. Moore showed a microscopie slide, prepared to demonstrate that the antennae of the genus *Trachysceles* have eleven joints, and not ten as hitherto described.—Mr. Kenneth J. Morton communicated a paper on "Lepidoptera collected by Lt.-Colonel C. G. Nurse, chiefly in North-Western India." Mr. W. J. Kaye communicated a paper on "The History of *Chamaeleo (Cruria) leilus*," by L. Guppy, Junior, which was followed by a discussion on the migration habits and distribution of the species. Commander J. J. Walker said that he had seen with it at Panama, where it was believed popularly that the insects made daily migrations from one side of the isthmus to the other. Mr. W. Pitt said that Mr. Guppy's description of the egg at once suggested that the species should not be included in the Geometridæ. Mr. G. C. Champion suggested that it belonged to the butterfly stirps. The President and other Fellows also joined in the discussion.—H. J. Moore, Esq., Vice-Sec.

THE SOCIETY IN LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—
Wednesday, 1st Dec. —Mr. R. Adkin, F.E.S., President, in the chair.
Mr. Adkin exhibited the various named forms of *Nonagria geminata*.—Mr. George photographs of a female *Hybena marginaria* and *Hybena marginata*, both at rest on trunks, the former most inconspicuous, the latter very conspicuous; also the former insect set in a white case.—Mr. Newman, bred series of *Plusia bractea* from Rannoch and South England, the former being much less green and much brighter.—Mr. R. Adkin, a number of named forms of *Pararge mera* from various Continental countries, and read a note on the directions which the variation takes in the species presenting out an extreme form of var. *adrasta* taken by Mr. Harrison, a series of the same species from Switzerland, including a very fine var. *triops*.—Mr. Turner, a number of named forms of *Geometra glucinaria*, *G. pulchra*, *Psodos quadrifaria*, *G. lutea*, *G. luteola*.—Dr. Chapman, living specimens of *Thaum polyxena* from the Andes.—Mr. B. Adkin, specimens of the following species, showing intermediate forms between the typical forms and the extreme forms: *Pyrausta coryndata*, *B. abietaria*, *Eupithecia venosata*, *E. venosata*.—Mr. Franklin, a large number of specimens bred

by him during a series of experiments to show the effects of physical and chemical agencies on pupæ, and read a paper giving a summary of the results obtained.—*Hy. J. TURNER, Hon. Rep. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*March 5th, 1907.*—Rev. C. R. N. Burrows exhibited *Nemoria viridata*, with microscopic slides of larva, ovum, and pupa, in illustration of his paper on the species.—Dr. T. A. Chapman, *Leioptilus carphodactylus*, a species new to the British list, received from Mr. Purdy, of Folkestone; also a dark specimen of *L. tephradactylus*, and *Peronea cristana*, vars. *gumpiana* and *subcapucina*; also a pupa of *Hastula hyerana* with mandibles of larval pattern.—Mr. J. A. Clarke, a series of *Ematurga atomaria*, including many dark brown unicolorous forms.—Dr. G. G. C. Hodgson, *Nemoria viridata*, showing variation with regard to white lines on fore wings; one specimen showed only one line (= Linnean type), in another the lower end of outer line was bent outwards towards the anal angle, and in a third this line was markedly crenulate.—Mr. L. B. Prout, *Nemoria porrinata* (Zeller), from South Europe, apparently indistinguishable from *N. viridata*, but said to be separable by brown spots on costa and brown fore legs.—Mr. P. H. Tautz, *Diphthera orion* bred from New Forest, including a specimen with brown marbling much accentuated and the green ground darker and duller than usual.

March 19th.—Messrs. F. B. Cross, D. Langford, and E. Reid were elected Fellows of the Society.—Mr. A. Harrison exhibited a photo of two pupæ of a large Tineid *Binsitta* (? sp.) from Upper Burmah, which showed a striking resemblance to the head of a small snake (*Lycodon aalicus*) common in Burmah; of two pupæ received, one resembled in colour and marking the type, and the other a striking variety of the snake in question.—Dr. G. G. C. Hodgson, a remarkable *Nemoria viridata*, lent for exhibition by Mr. Sidney Webb, with the cilia of all wings and the costal nervure of a deep green colour; also a larva of *Erebia blandina*, hibernated in captivity.—Mr. A. W. Mera, a living female *Nyssia lapponaria*.—Mr. L. B. Prout, *Melanippe procellata* var. *inguinata*, from India and Japan, and *Mesoleuca casta*, from Japan.

April 2nd.—Mr. A. H. Shepherd was elected to membership.—Mr. W. J. Cox exhibited a coloured plate printed on paper which, while presenting the glazed surface of a hot-pressed paper, was said to be free of the perishable properties of the latter.—Mr. H. M. Edelsten, larva and pupa of *Lithosia muscerala*, reared *ab ovo* in captivity.—Mr. J. H. L. Grosvenor, a long and variable series of *Phigalia pilosaria* from Reigate district, including a melanic male with a metallic green tinge on fore wings.—Mr. L. W. Newman, a bred series of *Polygonia c-album* from Monmouth; also a cocoon of *Dicranura bicuspis*, formed between two patches of lichen, the edges of which were drawn over the cocoon.—Mr. Newman reported that larvæ of *Arctia caia* were practically non-existent in localities in Kent where they were usually abundant; the few larvæ found were unusually advanced, suggesting that the hot autumn had carried them past the usual stadium, and the majority had died during the winter in consequence.

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—anted male and female *Nysius* Newman, half-fed larvae of *Thaumatoxenus galaioides* and *Dryas raphia*, continuation of his remarks at — reported that at Sunderland — rarer and very scarce, while — they are exceptionally back- — course of a casual discussion — mitted that he had observed in — larva left the sallow bushes on — in various low plants.—S. J.

—March 18th, 1907.—Mr. —— chair.—The Rev. C. F. —— Lepidoptera: *Agrotis neglecta*, ——shire, a specimen of the rare —— by Mr. F. C. Woodforde; —— which emerged unlooked-for in ——shire larva, and which he —— fine variety of *Helotropha* —— taken at sugar in his own —— been illustrated by Barrett; ——, from Burnt Wood; and —— variable variety bred with others ——. —— Leurick, a number of Pyralidae —— and very various Lepidoptera —— also exhibited; it certainly —— of Müllerian mimicry.—Mr. J. T. —— had made and filled with well- —— hanging it in Board Schools in ——. —— Mr. G. T. Bethune- —— L., from many localities, and —— Alpine specimens were, and that —— coloured of all.—Mr. A. H. —— Rev. E. N. Bloomfield referring to his —— *potentilla* on November 19th —— was not quite correct in saying that it —— had taken it at Battle and near —— WAINWRIGHT, Hon. Sec.

ARTS AND LITERATURE.

Zoological and Natural History
Established by the Society, London
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Mr. Mera remarks on the results of a *Vivipara lapponica* female and *N. zonata* in insect life from the neighbourhood and there are some exceedingly interest-

ing observations on that bygone entomological locality, Hammersmith Marshes. Mr. L. B. Prout contributes an important paper on "The *Rheumaptera hastata* group," occupying twelve pages, from which we gather that the association of the British species so generally included under *Melanippe* is not in the least correct. Some of these species have to go in one genus and some in another, but the species *tristata*, *alternata* (*sociata*), &c., are referred to *Epirrhoë*, Hüb., and the only British species of *Rheumaptera*, Hüb., is *hastata*. The European *luctuata*, Schiff., which has been considered to be generically associated with *hastata*, is here supposed to find its most probable allies in *picata*, Hüb., *annulata*, Hüb. (*unangulata*, Haw.), &c., and should therefore be placed in *Euphyia*, Hüb. Three local races, and four aberrations of *hastata* are discussed.

There is an excellent paper by Dr. Chapman on the "Differentiation of *T. tridens* and *T. psi* in the Imaginal Stage." Probably we have no other two Noctuid moths more difficult to distinguish in the perfect state than these two Acronyctids, consequently they are frequently mixed in collections. Of course in the larval state the differences are so obvious that separation is then quite simple. Dr. Chapman affirms that there are many differences between the imagines of one species and the other, but at the same time he admits that there are no differences whatever. This means that to the practised eye certain peculiarities of form, colour, and marking are recognized as belonging to this or to that species; but these distinctions are so subtle that they cannot be conveyed in a differential description. Until one has acquired the necessary experience, it seems to be advisable to admit only specimens reared from larvæ to one's series of each species. However, where captured specimens happen to be males, correct identification may be assured by examination of the genitalia, and the author illustrates this point by two helpful plates, which by his courtesy, and the permission of the Society, we have here reproduced.

Another paper of very great interest is that by Mr. Sich, entitled "Notes on the Micro-Lepidopterous Fauna of the London District Tineina."

Eleventh Annual Report of the State Entomologist of Minnesota for the Year 1906. Pp. 87.

THIS is the Fifth Annual Report of the State Entomologist, Dr. F. L. Washburn. Among other matters of interest in this report is a chapter on the Cabbage Maggot and other pests, and accompanying this is a coloured plate, showing some of the enemies of the said maggot. An illustrated Entomological Calendar should be useful to farmers and fruit-growers.

Butterflies of Hongkong and South-East China. By J. C. KERSHAW, F.E.S., F.Z.S. Parts iv. and v. (London agent: R. H. Porter.)

Part iv., pp. 65-82, treats of the Lycenidæ, and pages 83-86 are occupied with General Notes. Plates viii. and ix. are also comprised in this instalment. Part v., pages 87-118, deals with the Pierinæ and Papilioninæ and is illustrated by Plates x.-xiii. Parts i.-iii. of this work were referred to, *ante*, p. 48.

Transactions of the Hull Scientific and Field Naturalists' Club for the Year 1906. Edited by THOMAS SHEPPARD, F.G.S. Vol iii. Part iv. Pp. i.-viii., 247-313. Hull: Brown & Son, Ltd., 1907.

"Hymenoptera of the East Riding of Yorkshire." By W. Denison Roebuck, F.L.S.; and "Bygone Hull Naturalists. iii.—William Spence," with portrait, are the chief entomological items.

Christ's Hospital, West Horsham, Natural History Society: Fourth Annual Report for the Year 1906. Pp. 34.

WE are pleased to see that entomology is in favour among the members of this Society. Since its inauguration in 1903 the lepidopterists of the entomological section have been more and more active during each season. The number of species of Lepidoptera taken in 1906 exceeds the total of the previous year by thirteen, and is sixty-nine species ahead of the tale of 1903. Among the more notable insects obtained last year were *Deilephila livornica*, "found by W. P. Nason on June 6th in Thornton A Changing-room"; *Chærocampa celerio*, "picked up by H. F. Clark, on the asphalte behind Coleridge, on October 16th"; and *C. nerii*, "found on September 6th, near Fulford's, by a man who, while engaged in trimming a hedge, knocked it out and then 'put his foot on it to keep it quiet.'" Of *Heliothis peltigera*, "one specimen was found by Willey, in the Cloisters, on May 31st," and the captor of this species has also recorded an example of *Acidalia rusticata*, taken on July 27th; previous Sussex localities for this insect are Lewes and Brighton.

There are four plates, reproduced from photographs, and one of these illustrates the three Sphingid moths just mentioned.

Proceedings of the Hawaiian Entomological Society. Part 2, Pp. 37-78. Honolulu, December 1st, 1906.

CONTAINS an account of the Proceedings at the six meetings held January 4th, 1906—June 7th, 1906, together with the Presidential Address and the following papers:—"A New Method of Relaxing and Cleaning Specimens," by Mr. R. C. L. Perkins; "Life-history Notes and Observations on Three Common Moths," by Mr. O. H. Swezey; "Notes on Hawaiian Wasps, with Descriptions of New Species," by Mr. R. C. L. Perkins (abstract); "Note on *Tomocera*, a Genus of Scale-bug Parasites, with Description of a New Species," by Mr. R. C. L. Perkins.

In his address the President gave "an account of the endemic insects that are found on that part of the Honolulu Mountains known as Tantalus, and its adjacent slopes."

The three species of moths mentioned in Mr. Swezey's paper are *Plusia chalcites*, Esp., *Spodoptera (Caradrina) exigua*, Hübn., and *S. mauritia*, Boisd. Referring to *S. exigua*, the author states: "It is not nearly so common on these Islands as *S. mauritia*. I have found it on only two occasions. The first was at Pahala, Hawaii, December 5th, 1905. A large number of larvae of all sizes were found feeding on castor-oil plants. Several batches of eggs were also found."

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NEW AFRICAN ZYGÆNIDÆ.

By DR. K. JORDAN, F.E.S.

1. *Anomæotes triangularis*, spec. nov.

♂. Upper side of body black, thorax and base of abdomen partly tawny; under side yellow. Fore wing ovate-triangular, proximal half, except costal margin, tawny, rest black; four subcostals, the first connected with the costal, the other three stalked together; upper angle of cell much produced, truncate. Hind wing small, triangular, semi-transparent like fore wing, black, costal margin, cell, and abdominal edge yellow. Under side more extended tawny yellow, the hind wing being entirely of this colour, except a distal marginal band of about 2 mm. width, narrowing almost to a point at anal angle. Length of fore wing 12 mm., of hind wing 7 mm.

Hab. Sierra Leone. One male in the Tring Museum.

2. *Epizygæna procrioides xanthosoma*, subsp. nov.

♂ ♀. Abdomen pale yellow, except base and tip.

Hab. Uganda, British East Africa, Somaliland, and Abyssinia. A series in the Tring Museum; also in the British Museum.

3. *Epizygæna microsticha*, spec. nov.

♂. Body above green-black; sides of pronotum and of abdomen, a spot on the patagia, the spots of the fore wing, and the hind wing, yellow; under side of tibiae yellowish, of abdomen dark blue. Fore wing above pale dull blue, with darker edges; six small spots, two near base, the anterior one being elongate, one in middle of cell, one below cell, a fifth at apex of cell, and a sixth transverse, parallel with distal margin. Hind wing with narrow black distal border. Under side of fore wing yellow, the spots of upper side indicated, the costal and distal margins blue-black. Length of fore wing 9 mm.

Hab. Grahamstown, Cape Colony. One male in the British Museum.

4. *Epizygæna lateralis*, spec. nov.

♂. Body dark blue, sides of prothorax, the patagia, and the spots of the fore wing yellow; a row of confluent lateral spots on abdomen deep red; upper side of anterior femur and under side of anterior and median tibiae and tarsi yellowish. Fore wing purplish blue, greenish blue at the apex; five spots, the first large, rounded behind, reaching close to costal edge, second and third in middle, close together, the third being round, the fourth at apex of cell, also round, the fifth transverse, submarginal. Hind wing red, semi-transparent, costal edge yellow, distal edge very narrowly black, anal angle rounded; distal margin more distinctly incurved than in the other species of *Epizygæna*. Length of fore wing 18 mm.

Hab. Natal. One male in the British Museum.

5. *Saliunca difformis*, spec. nov.

♂. Body greenish blue-black, a spot on the patagia and the sides of the abdomen dirty white; the posterior abdominal segments slightly iridescent. Upper side of fore wing dark bronze-green, purplish from base to disc; a basal streak, a rounded or quadrate spot at apex of cell, and a more or less distinct spot between m^1 and m^2 dirty white. Hind wing purplish blue-black, like the fore wing slightly glossy; usually a streak behind cell and another at abdominal margin transparent; a spot at apex of cell dirty white. Under side greener than upper, the white basal streak of fore wing longer, the base of the costal margin of fore wing and the base of hind wing from abdominal margin into cell also more or less dirty white.

♀. Body greenish blue-black, without white markings. Wings also without white spots. Upper side purple-green, bronze-green at apex and distal margin, a little more glossy than in male; fringe purple. Hind wing blackish blue. Under side uniformly bronze-green, slightly bluish, abdominal edge of fore wing and the fringe purplish. Cell of hind wing truncate in male and female, the cross-vein between costal and subcostal not being angulate. Length of fore wing 12 to 18 mm.

Hab. Unyoro, and, in a slightly different form, also in British and German East Africa. The sexes have repeatedly been caught in copula.

6. *Saliunca assimilis*, spec. nov.

♂ ♀. Sexes similar. Body bluish bronze-green, without white markings. Upper side of wings more glossy than in *S. difformis*; fore wing bronze-green, with white spot at apex of cell, the male bearing a second spot between the median veins. Hind wing green-blue. On under side both wings bronze-green, bluish towards base. Neurulation as in *S. difformis*.

Hab. Fort Johnstone, Nyassaland, January–February, 1896 (Dr. Percy Rendall). A pair in the Tring Museum.

7. *Saliunca nitens*, spec. nov.

♀. Upper side of thorax and fore wing glossy green, slightly bluish; upper side of abdomen and hind wing purplish blue. Under

side of body green, of wings blue; apex and costal edge of fore wing glossy green. Fore wing with small white spot at apex of cell.

Hab. Unyoro, and Mpwapwa, German East Africa. Two females in the Tring Museum.

Perhaps only a geographical form of *assimilis*.

8. *Saliunca glennia*, spec. nov.

♂ ♀. Body dark blue-green; abdomen of male ventrally at the sides with a row of white spots. Upper side of fore wing glossy bluish green, with white spot at apex of cell, the spot being minute in female. Hind wing dark bluish bronze-green, in male with small white spot at end of cell. Under side blue, the white spots rather larger than above.

Hab. Salisbury, Mashonaland, December, 1900 (G. A. K. Marshall). In the British Museum a pair found *in copula*.

9. *Saliunca ventralis*, spec. nov.

♂. Like *S. styx*, Fabr. (1775), but the under side of the abdomen creamy white, except the last segment.

Hab. Entebbe, Uganda, September 7th (G. Degan). One male in the Tring Museum.

10. *Saliunca mimetica*, spec. nov.

♂ ♀. Superficially resembling *Netrocera setioides*, Feld. (1874). Body greenish black, head brownish; upper side of thorax, except a mesial stripe, and fore wing ochraceous. Distal margin of fore wing broadly black purplish, this band produced basad below cell. Hind wing black, yellowish grey in front. Under side like upper, but cell and costal margin of hind wing ochraceous. Apex of cell of hind wing angulate between c and sc^2 .

Hab. Sapele, Niger (F. W. Sampson), one male in the British Museum; a female from Upoto, Congo, in the Tring Museum.

11. *Neurosymploca affinis*, spec. nov.

♂ ♀. Similar to *caffra*, L. (1758). Frons unicolorous; the red spots behind eye and on pro- and mesonotum much longer, transverse; palpi, legs, and under side of abdomen yellowish white, often reddish. Spots of fore wing as in *caffra*, usually edged with white. Hind wing of most specimens basally transparent. Anal tergite of male on each side with a long process, which is absent from *caffra*; process of penissheath straight, only the extreme tip hooked, the process being crook-shaped in *caffra*.

Hab. Knysna, Cape Colony, and Cape Town. A series in the Tring Museum.

CHALCONYCLES, gen. nov.

♀. Near *Metanycles*, Butl. (1876). Antenna flabellate, being proximally dentate and distally pectinate. Palpi small; tibial spurs short, hind tibia with one pair. Neuration as in *Metanycles*, but the

the few small sinuositys of first wing more proximal, and first and second sinuositys of hind wing distal.

25 *Thaumatoxylon retulatum*, spec. nov.

Fore wing a dark and lustrous glossy bluish green. Hind wing
yellowish green with a vermilion streak below cell, reaching from base to
margin near apex. Length of fore wing 9 to 10 mm.

22. *Emuina. Tchagra. September, 1900 (Major Rattray).*
" " *Emuina. Tchagra. November, 1900 (Major Rattray).*

SAINT-ELLIS, sen. BOV.

Abdomen petiolate, the last four or five segments dentate. Hind tarsus with one pair of spurs. In fore wing second and third submarginal and basal basal and fifth, stalked together; the other veins from the cell, first radial from lower angle. Second radial and first marginal close to angle, second median a short distance from first radial. In hind wing all the veins from cell, subcostal distant from c, the anterior margin of cell between subcostal and the bar which connects it with the costal vein longitudinal, slightly oblique; first marginal and subcostal, cross-vein between first and second radial slightly oblique, third radial from lower angle of cell, second radial and marginal close to angle, second median distant from it.

13. *Satunella marshalli*, spec. nov.

Fore wings dark and costa of fore wing greenish; hind wing semi-transparent. Wings bluish beneath at base, greenish yellow greenish. Length of fore wing 6 mm.

199. *Malacca, N.S.W.*, March 25th, 1897 (G. A. K. Marshall).
199. *British Museum.*

VALAMBRIA, gen. nov.

anterior margin, gradually fining to a point, the last segment widest, the branches short, widest at the tips. Tongue with one pair of spurs. In fore wing all veins proximal of angle of cell, third radial from angle and first median close to angle, second radial and first median close to angle, but less proximal than first subcostal. In hind wing instant from c, the cell-edge between them longitudinal: first radial near subcostal, cross-vein between veins regular, lower angle of cell truncate, second radial near angle, but separate, first median proximal of

new genus in the antennal pectinations being
and with hind tibial spurs longer, first and second
wing much more proximal, second median
wing between costal and subcostal
and longer, not being distinctly
median of hind wing being more

14. *Malambria durbanica*, spec. nov.

Body and upper side of fore wing bluish black, without gloss; hind wing and under side of both wings blackish brown, slightly purplish. Length of fore wing $8\frac{1}{2}$ mm.

Hab. Durban, Natal. One male in the British Museum.

15. *Homophylotis leptis*, spec. nov.

♂. Body above blue, beneath brown with a purplish sheen; a long spot before apex of antenna white; eyes edged with grey, centre of frons, legs, and palpi luteous. Wings very narrow, purple-brown; hind wing with a broad vitreous stripe below cell, extending from base to near distal margin. Under side of wings brown. Length of fore wings 8 to 9 mm.

Hab. Pungo Andongo, Angola, April, 1875 (A. von Homeyer). Three males in the Tring Museum.

16. *Homophylotis catori*, spec. nov.

♂. Upper side of body and fore wing blackish green; hind wing with a very broad vitreous streak, extending from base close to distal margin, and from centre of cell to hind margin, the greenish black marginal band being widest at anal angle. A spot before the somewhat incrassate apex of antenna, the frons, palpi, sides of breast, the under side of the abdomen, except a basal central spot and the last segment, and the under side of the femora, tibiæ, and of the first tarsal segment, yellow. Length of fore wing 8 mm.

Hab. Moyamba, Sierra Leone, February, 1903 (D. Cator). One male in the Tring Museum.

POMPOSTOLINÆ, Subfam. nov.

Ocelli absent. Mid and hind tibiæ incrassate, the latter in male with scent-organ situated in a dorsal groove, which bears proximally a tuft of very long hairs. In both wings, first radial from upper angle of cell and second radial from lower angle, first subcostal and second median far distant from proximal angle, first submedian absent.

Type: *Pompostola hyparchus*, Cram. (1779).

17. *Arniocera pæcila*, spec. nov.

♂ ♀. Body dark bronze-green; dorsal edge of patagia, upper side of abdomen, except first and second segments, the palpi, a lateral spot on prosternum, and a large spot on the mid and hind tibiæ, or only on the mid tibia, red. Upper side of fore wing bluish green, with yellow markings edged with black: a subbasal band, an interrupted or mesially constricted median band, an elongate subapical spot, and a small rounded spot situated near hind angle. Hind wing uniformly green-blue. Under side greenish blue, the two distal spots of fore wing and the costal portion of the median band distinct.

Hab. Various places in Usoga, Kavirondo, Uganda, and British East Africa. A series in the Tring Museum; also in British Museum.

18. *Arniocera amœna*, spec. nov.

♂ ♀. Head, palpi, a large patch on mid and hind tibiae, and the upper side of abdomen, except the first segment and a row of black mesial dots, pinkish red; under side of body bronze-green. Upper side of fore wing glossy pale green, with pale red black-edged markings, namely, a subbasal band, a complete or posteriorly interrupted median band, a costal subapical spot, and an elongate submarginal spot placed parallel with the distal margin. Hind wing pinkish red, distal margin and a discal band joining the same posteriorly being purplish black.

Hab. Mpwapwa, German East Africa. A series in the Tring Museum.

NETROCERA, gen. nov. (ex Felder indescr.).

♀. Palpus porrect, second segment with long fringe. Club of antenna longer and more slender than in *Arniocera*, Hopff. Spurs of hind tibia longer.

Here belong *setioides*, Feld. (1874), *tiphys*, Boisd. (1836), and the following new forms:—

19. *Netrocera setioides ugandæ*, subsp. nov.

Differs from *setioides* in the black marginal band of the fore wing being broader and very sharply defined, and in the abdomen being without any yellow scales at the sides.

Hab. Entebbe, Uganda, June, 1900 (Capt. Rattray). One male in the Tring Museum; a female from the same place in the British Museum (E. A. Minchin coll.).

20. *Netrocera tiphys basalis*, subsp. nov.

First and second abdominal segments yellow at the sides, the black distal marginal band of the fore wing not sharply defined above, its curved edge being washed out except at costal margin, the band anteriorly two or three times as broad as posteriorly.

Hab. Pungo Andongo, Angola, in February and March, 1875 (A. von Homeyer). One male and three females in the Tring Museum.

21. *Netrocera tiphys diffinis*, subsp. nov.

The first three abdominal segments yellow at the sides. The black distal marginal band with almost straight proximal edge, broad anteriorly, entering apex of cell.

Hab. Nguelo, Usambara; Monkey Bay, Nyassa, January, 1896, and Fort Johnstone, January–February, 1896 (Dr. Percy Rendall). Three males in the Tring Museum.

CALLIBAPTES, gen. nov.

♂. Palpus porrect, very long, being much longer than the fore tibia; first and third segments short, second prolonged, without fringe. Antenna much thinner than in *Netrocera* and *Arniocera*. Fore tibia much shorter than fore tarsus; spurs long; femora not fringed beneath; sc^4 and sc^5 of fore wing on a long stalk, sc^6 and r^1 branching off close to this stalk, r^2 and r^3 on a short stalk; in hind wing sc^6 and r^1 stalked, r^2 and r^3 from lower angle of cell.

22. *Callibaptes ornata*, spec. nov.

Body greenish black; first and base of second segment of palpus, the head, except a large spot on frons and another on occiput, the sides of the pronotum, the patagia and a mesial stripe on metanotum, as well as the tips of the mid and hind coxae, yellow; third to fifth abdominal segments above bright red; under side of abdomen paler red, the last segment and a lateral line greenish black. Fore wing ochraceous yellow on upper side, with a broad green-black distal border, which is sharply incised at lower angle of cell; hind wing red, with a broad purple-blue distal border narrowing behind. Under side yellowish red from base to apex of cell, the distal area being purple-blue. Length of fore wing 15 mm.

Hab. Ogruga, Niger. One male in the Tring Museum.

MELISOMIMAS, gen. nov.

♀. Palpus very short. Tongue vestigial. Antenna pectinated from base to apex. Legs with brushes of hair-scales; hind tibia with one pair of spurs. In fore wing third to fifth subcostals stalked together, r^1 from the upper angle of cell, r^2 and r^3 from the lower; cell of hind wing short, bar connecting c with cell long, oblique, subcostal and first radial on a long stalk, cross-vein deeply angulate, hind angle of cell produced, acuminate, third radial and first median on a short stalk.

Type: *Melisa grandis*, Holl. (1893).

23. *Byblisia ochracea*, spec. nov.

♀. Palpus as long as in *latipes*, Walk. (1864). Body blackish blue, a spot on frons and under side of head white; pronotum, posterior portion of mesonotum, the metanotum, upper side of abdomen, except the last three segments, sides of breast, and the mid and hind tibiae yellow; tibial spurs, under side of hind femur, and the centre of the proximal abdominal sternites white. Wings as in *B. latipes*, but the hyaline spots larger, especially the basal streak of the fore wing and the vitreous areas of the hind wing.

Hab. Warri, Niger, April, 1897 (Dr. F. Roth). One female in the Tring Museum.

24. *Byblisia caudata*, spec. nov.

♂ ♀. Third segment of palpus quite short; abdomen in both sexes with two long apical tufts. Body blue-black; palpus, except tip, sternum, a spot on fore coxa, base of pronotum, apex of patagia, and four or five abdominal belts red; apex of first abdominal sternite, a spot on mid and hind tibiae, and the spurs white. Wings purple or bronze-black, with small white semi-transparent spots, namely, a double one proximally of middle of fore wing, another at apex of cell, and a third behind first median branch, on hind wing one near base, and a second at apex of cell.

Hab. Mashonaland (H. B. Dobbie), one male in the British Museum. Lake Nyassa, one male and one female in the Hope Department of the Oxford Museum.

NOTES ON COLLECTING DURING 1906.

By THE REV. W. G. WHITTINGHAM.

THOUGH the advantages which a parson frequently possesses as an entomologist are obvious in the freedom with which he can in many cases arrange his hours of work, a town parson generally has his hands far too full to allow of anything like systematic collecting. His expeditions are largely a matter of his settled holidays, with an occasional Monday or summer evening, and with a more constant eye to the possibilities of his own garden, if he is fortunate enough to possess one. Last year I spent ten days at the end of June and beginning of July in North Cornwall, and a good deal of the month of August in Cumberland, apparently the only part of England wherein one read the daily report of glorious weather to the frequent accompaniment of drenching rain. I give some rather desultory notes of most of my captures.

To deal first with the home insects in Leicester and neighbourhood—the mild January and February brought out the first spring Geometers very early; *Phigalia pedaria* and *Hybernia rupicapraria* were out in January, and a series of *Lobophora polycommata*, bred from Northamptonshire larvæ, commenced to emerge on February 26th, and were all out by March 17th. Dark forms of *Hybernia marginaria* were frequent, and were several times observed, with dusky suffusion in disk, dark hind marginal area, and uniformly dusky. Then came the long spell of cold weather which produced little or nothing for weeks. A *Biston hirtaria* (female), bred by a friend, laid a batch of eggs early in April, which hatched on May 29th and 30th, and resulted in considerably over three hundred and fifty larvæ, two-thirds of which were let loose on plum trees in the garden, where they were seen feeding week after week till August. *Tephrosia crepuscularia* was plentiful during May and early June, the fuscous form apparently rather in excess of the light form. The earlier April race was not noticed, but this was perhaps due to the absence of opportunity for observation.

In May *Eupithecia abbreviata* and *Gelechia scalella* were taken at rest in Charnwood Forest; the larvæ of *Eupithecia debiliata* and *Phoxopteryx myrtillana*, and *Micropteryx aureatella* were plentiful there. A single specimen of *Eupithecia albipunctata* emerged from a pupa, the larva of which was found feeding there on *Angelica* last year.

At the end of May (30th and 31st) a visit to Northants produced *Carterocephalus palæmon* in small numbers, and *Argynnis euphrosyne* and *Nemeobius lucina* were only just appearing. *Tephrosia punctularia* and *Zonosoma punctaria* were almost the only Geometers seen.

The larvæ of *Plusia moneta* were discovered on both *Aconitum* and *Delphinium* in various parts of Leicester and the county. The insect seems to have established itself thoroughly as far north as this. On June 7th the larvæ of *Xylophasia scolopacina* were taken, still small and not numerous, though they fed up very rapidly. A morning in the Forest on June 12th produced *Venilia maculata* (few), and *Emmelesia albulata* plentifully, and the larva of *Nudaria mundana* were crawling about the lichen on a stone wall. During this month the trees all over the Forest district were almost completely denuded of their leaves by larvæ, mostly *Tortrix viridana* and *Hybernia defoliaria*. Possibly the late season brought on the larvæ more quickly than the leaves grew. At all events, I never remember their ravages being so marked; whole woods looked at a little distance as brown as in February. Happily they very soon succeeded in putting on a fresh growth of leaves. On June 22nd *Bomolocha fontis* was flying, and some eggs were obtained, the larvæ from which fed up and pupated at the end of August. *Hepialus velleda*, *Eupithecia debiliata*, and *Penthina sauciana* were obtained at the same time.

In the middle of July worn specimens of *Vanessa cardui* were noticed in this county, and larvæ of *Smerinthus ocellatus* were brought to me from several gardens. This is evidently a common moth in the neighbourhood of Leicester. Sugaring was almost a complete failure during the summer in this neighbourhood, a single example of *Orthosia suspecta* being the only insect obtained by this means of any interest. A female *Pericallia syringaria* was netted in the garden on July 15th; she laid a few eggs, which duly hatched, and the larvæ hibernated successfully sleeved on ash, and are now feeding on privet.

In September, *Macroglossa stellatarum* was noticed on two or three occasions in town gardens, and the following Vanessids were also seen: *atalanta*, *cardui*, *io*, and *urticæ*; but butterflies were certainly not plentiful in the late summer. The common late summer and autumn moths appeared in the garden, among them *Polia flavigincta* and *Xanthia gilvago*. The larvæ of *Hybernia defoliaria* and *aurantiaria* had been plentiful, but the emergences in the autumn were very few in proportion to the larvæ obtained, owing, perhaps, to the very dry summer. They were also late in emerging, the first *aurantiaria* appearing on November 11th, and the first *defoliaria* on November 14th. A fairly long series of *Himera pennaria* was also bred from a local female, including one male with the wings, especially the hind marginal area, suffused with rosy—a somewhat pronounced example of the coloration more usual in females.

I had an unpleasant and, fortunately, quite exceptional experience with some larvæ sleeved in the garden—*Selenia lunaria* almost full-fed, and large broods of *Acidalia versata* and *Abraxas*

grossulariata, which I hoped to bring through the winter on the chance of getting some varieties. Some nocturnal predators in search of apples, assuming doubtless that the sleeves were protecting some peculiarly desirable fruit, took the lot, untying the sleeves at the further end, and stripping them off, leaves and all. The marauders were, let us hope, thoroughly sold when they examined the prize they had secured, and so far that was satisfactory; but I confess, in spite of this sense of satisfaction, I regarded the stripped stems somewhat ruefully. Only on one other occasion that I can remember have my pursuits been interfered with in this way, and that was years ago, when I discovered a band of small boys in Epping Forest going round my sugar with a lantern, and picking off the moths with their fingers. As they were more or less of the London breed, to chase them round my circle (a fairly large one) was neither a very congenial nor a very successful task, and to pack up one's things and go seemed the more discreet part to take.

(To be continued.)

COLLECTING LEPIDOPTERA IN THE LAKE DISTRICT
IN 1902, 1903, AND IN 1905, 1906.

By A. H. FOSTER.

BEING much interested in reading in the 'Entomologist' the experiences of Messrs. P. J. Barraud and A. E. Gibbs while collecting in Cumberland (Entom. xl. p. 67, *et seq.*), I think perhaps the following notes of my own experiences of the Lepidoptera of that district may be of interest for comparison.

In 1902 I went to Westmorland in the middle of July for a fortnight's collecting, the object being to study the butterflies and moths in general, and to search for *Erebia epiphron* in particular.

Langdale Pikes seemed from all accounts to offer a likely field for investigation, and accordingly I put up at a wayside inn at Little Langdale village. I was accompanied by a friend who, though not himself a collector, was very keen to help me by catching everything he could.

The weather was almost perfect the whole of our stay, and our attention was quickly turned to hunting for *E. epiphron*. We searched the sides and tops of the following mountains—Wetherlam, Great How, Coniston Old Man, Pike of Blisco, Fairfield, and Dollywaggon Pike, but without seeing the faintest trace of *epiphron*. Our next attention was turned to Langdale Pikes, where, after getting quite to the top and going down a little on the other (north) side, we found *epiphron* in the greatest pro-

fusion. The butterflies were found over an area extending from the top of the mountain, at the back of Harrison Stickle (the highest "pike"), northwards to the top of High White Stones, and westwards to the left as far as the track leading into Langstrath, known as Stake Pass. This area is a wide, dreary expanse of coarse grass, rushes, and bog, which slopes gently towards the head of Borrowdale. The whole of this area is above 2000 ft. high, and is exposed to the full force of the north and north-west gales and storms, and these storms are some of the worst it is possible to encounter. It is a remarkable fact that on the south side of Langdale Pikes, about three-quarters way up the mountain, there is an extensive grassy plateau, beautifully warm, and sheltered from all the strongest winds and rain; but, in spite of this, I have never found *epiphron* on this place, with the exception of one specimen, which, oddly enough, we took on the first day we ascended the mountain. This was the first specimen of this butterfly I ever saw alive, and was the only one taken on that day (because on that day we did not go high enough up to find others). I have been over this plateau at least twenty or thirty times since, but have never seen *epiphron* on it again.

This butterfly is a most interesting insect; it never flies while the sun is not out, but however strong the wind or wet the grass, directly there is a gleam of sun, the butterflies appear in scores, and the whole place seems alive with little black dots moving about; directly the sun goes in, the "black dots" go in too, disappearing as if by magic; and so thoroughly do they "go in" that it seems practically impossible to find a single specimen in the grass, however diligent the search.

We also found *E. epiphron* fairly abundantly on and near the top of Red Scree, overlooking the Kirkstone Pass; and in 1903 I found it on the side (north-west) of Helvellyn, and on the top of Honister Crag, and on the top of Brandreth; in fact, on the tops of all the mountains which form the head of Ennerdale and Buttermere Valleys, *viz.* Fleetwith Pike (= Honister), Grey Knotts, Brandreth, Kirk Fell, and the back of Green Gable; but I could never find it on Great Gable nor, with the exception of one specimen, anywhere round Stythead Tarn, nor between there and Esk Hause or Rossett Ghyll. I mention these places in detail because many of them are mentioned in Newman as localities for *epiphron* (Great Gable, Honister, Stythead Pass and Tarn, Langdale Pikes, and Red Scree). I do not know the experiences of other collectors as to localities for this species, and should very much like to hear some to compare with my own. I have very rarely found it at a less elevation than 2000 ft., and I cannot call to mind ever taking it on the south side of any mountain; the sides and tops of all those mountains above mentioned on which it was taken are all exposed to the

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WILSON AND BELLER-WEST. I should particularly like to know if *Plusia interrogationis* occurs on any of the following mountains: Blencathra, The Hall Hills, High Stile, Red Pike (Buttermere), Blue Bell, Simcock, Robinson, Grassmoor, Skiddaw, Caulbeck, or the Arkleveat Fells, or on any of the fells beyond the Lake District and in Great Derb.

I mention but other insects besides that just referred to, because I find almost the most likely ground for search. This is the fell which borders Little and Great Langdale Valleys, and is almost entirely covered with heather. It is about 1400 ft. high at its highest point, and is the only heather-covered hill anywhere in the neighbourhood. Almost the first insect captured in this according to the "heather-region" was *Plusia interrogationis*. We did not investigate this fell until we had been there a week, and as we had taken enough *E. epiphron*, we turned our attention for almost the whole of the remaining week to hunting *L. callunae* and other insects over the heather. And truly it was a hunt: a blazing hot sun, heather that grew as thick as one's arm and growing four or five feet high, holding tracks over which one stumbled at every step, and to these difficulties the picture of two very energetic and very excited collectors running at full speed after these insects seemed to flash about like lightning, and one had a true picture of those hunts after *interrogationis*. However, we went hunting over rocks and into bogs and much scraping had to be resorted to secure forty-eight specimens of the *Plusia* during the week. Next year (1903) we went a week earlier in summer to try and get as many *P. interrogationis* as possible, but we never saw a single specimen, nor yet have I seen it in the two subsequent seasons in which I went there. We also took with quite a different lot of insects to those in the previous year, and were particularly engaged in chasing *L. callunae* var. *callunae*, the males of which were scattered about all over the heather; but they were very difficult to catch, because of the difficulties above enumerated. I turned my attention to hunting a female, but could not do so until two or three days later, when, oddly enough, I found two on the heather. At this time our total captures of *L. callunae* were not more than a dozen, all males, but we succeeded in getting more in the two remaining days. It was only possible to catch at the front of one's coat and then go on to another side. If a male *callunae* happened to be on one's coat, it would be certain to pull up short, remain quiet for a while, would settle on one's coat, and then fly off. For the last week in 1902, and the first week in 1903, we were residing at Blea Tarn House, a small inn near the foot of Pike of Blisco on the one side or the other. From here we could

work Langdale Pikes and other mountains for *E. epiphron*, and Lingmoor was of very easy access for collecting over the heather.

(To be continued).

NOTES ON THE INCREASE IN NUMBERS OF LEPIDOPTERA-RHOPALOCERA IN MAURITIUS.

By CAPTAIN B. TULLOCH, F.E.S.

In England one has to deplore the fact that not only are local species of butterflies becoming still more local, and in some cases almost extinct, but also that many of the commoner species are gradually becoming scarce. This, of course, is due to many causes—as, for instance, the disappearance of forest lands, the drainage of fens, the trimming of hedges, and also to the insatiable desire of many “collectors” to obtain a long series of the same species. This desire for a series always seems to me to be one of the chief reasons why so many species of butterflies and moths are rapidly disappearing in Britain. In Mauritius, however, the very opposite is occurring, for not only are new species arriving by some means in the island, but even those species which do find a footing increase rapidly in numbers. Why this increase in numbers of a particular species should occur I will endeavour to show later on.

In 1833 Boisduval enumerated twenty species of butterflies as inhabiting Mauritius, or, including one doubtful species, twenty-one in all. Roland Trimen visited the island in 1865, and discovered twenty-six species. I myself arrived at the island in March, 1899, and soon found three other species, all common, not noticed by Trimen, viz. *Papilio demoleus*, *Zizera knysna*, and *Z. gaika*.

I have just received a letter from Lieut.-Colonel N. Manders, R.A.M.C., who asks me whether I found *Cocynis ligneus*, *Zizera maha*, and a species of *Lycæna* not previously mentioned. He stated that these three were all common in parts of the island. As I worked Mauritius pretty thoroughly whilst I was in the island, and did not find the three species mentioned, I conclude that they are also of recent introduction. But the most extraordinary thing is the rapidity with which a species multiplies once it has been introduced into the island. *Papilio demoleus* did not exist in Mauritius in 1865, yet whilst I was there it was to be found everywhere.

In the library at Port Louis I found a French natural history of Mauritius, in which mention is made of a white butterfly having been seen in the island, and the author, writing somewhere about the beginning of the nineteenth century, wonders

what kind of *Calliprinos* it was. This was probably *Catopsilia sorrela*, scarce by Trimen not to be common, but now swarming everywhere. Again, Trimen saw only one specimen of *Danais eresia*. This species is also now common everywhere.

Of other species mentioned by Trimen, *Atella phalaena* is so numerous in certain places that I have caught two at a time in my net. *Pyrrhopyge eriphia* was not seen, but is now common. *Vanessa atalanta* has increased in numbers, and so also must *Hipparchia semele* since Trimen only saw one specimen of this butterfly. He also only found *L. boetica* and *L. telicanus*, and what he thought was *L. hispanica*. I found *L. boetica*, *L. telicanus*, *L. uranisa* and *L. ingens* all common almost everywhere. So we find that in 1883 there were 21 species of butterflies observed in the island; in 1885, 26 species; in 1899, 28 or 29 species; in 1907, 32 species at least are reported. How the butterflies are to Mauritius is a matter of conjecture. The nearest large expanse of land is Madagascar, 550 miles distant. Once, however, a species reaches the island various causes allow it to remain and multiply. One is the absence of "collectors" so hasty and ferocious is it. The extraordinary variety and luxuriance of the vegetation of the island permit the incoming insect to either at once find its natural food-plant or some allied one, suited well to its use as well.

At Port Louis I found the larvae of *Daphnis nerii* feeding on *Acacia* and took them up to Curepipe, 1600 feet above sea-level, where no *Acacias* grow. The curator of the Curepipe Botanical Gardens, however, showed me an allied tree growing at the height, and on this the *nerii* larvae fed up readily. I subsequently found these larvae on half a dozen different kinds of plants. The larva of *Acherontia atropos* feeds on at least a dozen different kinds of trees and plants all over the island; consequently it is common in the island. Then, again, climatic conditions, and the great temperature between Port Louis at sea-level and Curepipe at 1600 feet, allow a continuous succession of larvae to be produced. I have often found eggs, larvae of different ages, pupae and imagines of *Papilio phorbanta* on the same plant.

The number reason for the increase seems to be the want of natural checks and other parasites. I bred nearly all the *Acacia* butterflies from larvae, and also dozens of hawk-moths, including *A. atropos* and *A. atropos*, and I do not remember to have in a single *Acacia* or pupa infested with ichneumons.

Another reason for increase, however, should be placed in the account that must be done to insect life by the violent winds which usually visit the island with more or less violence. In September, 1900, whilst I was in the island, a very violent wind lasted for three days arrived. So violent was it that all the leaves were torn off the trees, so that

what had a short time before looked like an impenetrable jungle was, after the cyclone had passed, as bare of leaves as an English wood in mid-winter. There is also very heavy rain, as a rule, with these cyclones, and innumerable quantities of eggs, larvæ, and perfect insects must be destroyed by the wind and floods. Yet a month after the cyclone mentioned the vegetation had recovered itself, and there seemed to be as many butterflies as ever. Do butterflies know when a cyclone is coming, and take extra precautions to hide in safe spots?

Moor Lane, Strensall, York.

NEW AMERICAN BEES.—III.

By T. D. A. COCKERELL.

Tripeolus banksi, sp. nov.

♂. Length about $9\frac{1}{2}$ mm., anterior wing $7\frac{1}{4}$; black, with the pubescence pale cinereous (not yellowish); head and thorax extremely densely punctured; labrum, antennæ, and mandibles entirely black; maxillary palpi three-jointed, but the basal joint small and easily overlooked; face covered with appressed silvery-white hair; thorax short and very high; scutellum dull and coarsely rugose, feebly or quite strongly bilobed; the lateral teeth black, fairly large and stout, but not surpassing scutellum; pleura hairy, the lower part more nude, densely punctured, with a shining spot posteriorly; markings of thorax above much as usual, but instead of a pair of lines on the mesothorax anteriorly, there are two large suffused flame-like areas of pale hair, more or less confluent with the pale hair of the lateral corners; tegulae dark reddish; wings rather dusky, quite strongly so on apical margin; legs black, the tarsi, especially the small joints, becoming pale reddish; spurs brown or reddish; abdominal bands greyish white; first segment with the black area a broad transverse band, squared off at the sides; the apical bands on segments one to three, and the others sometimes, interrupted in the middle, the bands on two and three somewhat club-shaped on each side; the band on two has a squarish anterior projection at the sides, which forms with the band a right angle or somewhat less; second and third ventral segments with a broad apical band of white hair; second segment also with the middle covered with white hair (except sometimes a central spot), but the sides (separated from the light by a straight line, and constituting about one-fourth on either side) dark; outstanding fringe of fourth and fifth ventral segments mainly black. Runs in tables of *Tripeolus* to *T. donatus*, Smith, of which it looks like a small form. It is, however, clearly distinct; the basal band of the first abdominal segment is perfectly entire (divided in *donatus*), the thorax beneath is densely white-haired (black and nude in *donatus*), the ornamentation of the mesothorax is different (*donatus* having distinct stripes), and the eyes are dark coffee-brown (light green in *donatus*).

Hab. Falls Church, Virginia, August 26th and September 7th (Nathan Banks). *T. donatus* I have from Ames, Iowa.

From the descriptions this may seem somewhat like *T. wyomingensis*, Ckll., but that has the pattern of the first abdominal segment entirely different; and the colour of the light bands of *banksi*, when placed beside *wyomingensis*, appears quite different—a sort of pale bluish by contrast.

Epeolus semilectus, sp. nov.

♂. Length about 9 mm.; black, shining; vertex, mesothorax, scutellum, and pleura with very large irregularly-placed punctures on a shining surface, the punctures dense in places, in others sparse; face with silver-white hair; labrum black, mandibles red in middle; second antennal joint red beneath, and scape red at extreme base; light markings white, not noticeably yellowish (but not bluish); mesothorax with two rather inconspicuous stripes; middle of ventral surface of abdomen densely covered with white hair; scutellum strongly bilobed, the axillar teeth sharp, but not surpassing it; tegulae apricot-colour; wings with the basal half hyaline, the apical half strongly rufo-fuscous; legs red, but the trochanters, and the hind femora and tibiae, mainly black, the hind knees broadly red, however; spurs on hind legs brown, on middle ferruginous; abdomen shining, with the punctures small and feeble; the light bands on apices of segments very narrow, that on the first broadly interrupted; transverse black area on first segment as broad as possible, ending obtusely and rather suffusedly very near lateral margins; extreme hind margins of segments, especially the apical ones, brownish; basal part of apical segments brownish; apical plate broad; ventral segments two and three with narrow white hair-bands. Close to *E. lectus*, Cresson, but abdomen not strongly punctured, half of wings darkened, and band on apex of first abdominal segment broadly interrupted. Still closer to *E. lectoides*, Robertson, but only one band interrupted. It may perhaps be a geographical race of *lectoides*, which is known at present from Illinois.

Hab. Falls Church, Virginia, July 4th (Nathan Banks).

Epeolus vernoniae, sp. nov.

♂. Length $7\frac{1}{2}$ mm. or a little less; vertex, mesothorax, scutellum, and pleura coarsely rugose; colour black, including scutellum, but tubercles and axillar teeth bright ferruginous red; clypeus very minutely and densely punctured; face with much silvery hair, slightly stained with yellowish about base of antennæ; labrum black, with two little ridges on its lower half in the middle; mandibles ferruginous, simple; antennæ brown-black; pubescence of thorax and abdomen above, forming the light markings, pale ochreous; mesothorax with two lines, not very conspicuous; scutellum emarginate in middle; axillar teeth large, conspicuously surpassing scutellum; pleura crossed by a rather indefinite band of light hair; tegulae bright apricot-colour; wings dusky hyaline, the apical margin broadly much darker; stigma amber-colour, nervures fuscous; legs red; middle femora with a blackish shade beneath, hind femora mainly black beneath and behind; spurs black; abdomen broad and convex, with fairly broad entire bands on all

the segments; black area on first segment a very broad band, almost dividing the light laterally; extreme hind margins of the apical segments light brownish; apical plate broad, its apical half red; hind margins of ventral segments broadly pale brown, those of the second and third with a thin covering of white hair. In Robertson's table in 'Canadian Entomologist,' October, 1903, this runs nearest to *E. pusillus*, but differs in the scutellum, which does not nearly equal the lateral teeth, and in the partly black legs. According to Brues, *pusillus* has the teeth at the sides of the scutellum red, as in *vernoniae*; but Cresson makes no mention of this, and it seems unlikely that he would overlook such a conspicuous character. Cresson also describes the abdominal bands of *pusillus* as cinereous, whereas in *vernoniae* they are very strongly yellow. The antennae of *pusillus* are said to be red basally; in *vernoniae* they are black, only the extreme base of the scape showing a little reddish. With all this, *vernoniae* may be a race of *pusillus*, but in the absence of any proof I leave it as distinct.

Hab. Falls Church, Virginia, September 4th, at ironweed (Nathan Banks).

Epeolus virginiensis, sp. nov.

♂. Length 9 mm. or a little less. A small species similar to *vernoniae*, but differing as follows: Eyes light green (light reddish in *vernoniae*); mandibles darker, the basal half black, the apical dark reddish; thorax smaller; stripes of mesothorax connecting with bands which run along the anterior margin and curve back to the tegulae (no such bands in *vernoniae*); tubercles and axillar spines black, the latter very much smaller, not nearly reaching the level of end of scutellum; pleura thinly overspread with hair, except just below the wings; tegulae cinereous, a little reddish behind; wings dusky, the apical margin not contrasting, stigma rufo-fuscous; all the femora black, except the knees; anterior tibiae black, except at ends; middle and hind tibiae red, the latter with a dusky shade in front; abdomen somewhat narrower, the bands perhaps not quite so yellow; band on apex of first segment interrupted, and that on apex of second with a linear interruption; apical plate only about half as broad. The mandibles are simple, and the spurs are black.

Hab. Falls Church, Virginia, September 7th (Nathan Banks).

At Glencarlyn, Virginia, September 6th, Mr. Banks took *E. autumnalis*, Rob.; new to Virginia.

Panurginus virginicus, sp. nov.

♂. Length about 5 mm.; black, with the general stature and appearance of *P. pauper* (Cresson), but easily distinguished by the lemon-yellow face markings, and especially by the large quadrate head, with the face very wide. Clypeus, lateral face-marks, labrum, mandibles (except the ferruginous tips), all yellow; but no supralabral mark. Lateral marks pyriform, not extending above level of clypeus, the point directed toward the malar region; clypeus well punctured all over; flagellum long, testaceous beneath except at apex and extreme base; mesothorax nude, very minutely and closely punctured, the median groove strong; tubercles and tegulae testaceous;

wings smoky, especially the apical half, very strongly iridescent; nervures dark fuscous; second r. n. meeting second t. c.; first r. n. joining second s. m. not quite one-fourth from base; legs black, with anterior tibiae in front, all the knees, apices of middle and hind tibiae, and all the tarsi, pale ferruginous; abdomen shining, the punctures exceedingly minute.

Hab. Falls Church, Virginia, June 4th (Nathan Banks).

Mr. Banks has also taken *P. pauper* (Cresson) and *P. illinoensis* (Cresson) at Falls Church in June.

University of Colorado, Boulder, Colorado:
March 19th, 1907.

NOTES AND OBSERVATIONS.

ACRONYCTA TRIDENS AND PSI.—With regard to the note on page 119 on the differentiation of these insects, is it not the fact that the females can be distinguished by the colour of the hind wings, which in *tridens* are grey, and in *psi* white? It is so at least in my series, all of which are bred; but if I am wrong in this, I shall be glad to be corrected.—(Rev.) W. CLAXTON; Navestock Vicarage, Romford.

CAPTURES AND FIELD REPORTS.

HALESUS RADIATUS.—Mr. A. Sich was kind enough to give me a specimen of this caddis-fly, taken at Chiswick on October 4th, 1903. The record is of interest on account of the encroachment of bricks and mortar over the neighbourhood.—W. J. LUCAS; 28, Knights Park, Kingston-on-Thames, May 18th, 1907.

VANESSA CARDUI.—On May 11th numbers were seen at Oxshott. They were flying strongly, and usually more or less with the wind, from a south-westerly direction. None were seen to settle, nor could a capture be made. They gave one the impression that they formed part of a migration.—W. J. LUCAS; 28, Knights Park, Kingston-on-Thames, May 18th, 1907.

CYANIRIS ARGIOLOUS IN NORTH-WEST LONDON.—I should like to record the fact that I saw a specimen of *C. argiolus*, L., in the garden here, to-day. It was flying in the bright sunshine, and appeared in fine condition, probably having just emerged. It has been observed here in May and July most years since 1899, and seems to have become firmly established. It is the only "blue" we ever see here.—HAMILTON H. DRUCE; The Beeches, Circus Road, St. John's Wood, London, N.W., May 11th, 1907.

SCARCITY OF LARVÆ IN SEASON 1907.—I notice in the reports of the City of London Entomological Society in the May 'Entomologist' that Mr. L. W. Newman comments on the scarcity of the larvæ of

Arctia caia this season. I can quite confirm his report, at all events as regards this neighbourhood. For several seasons past I have reared considerable numbers of *Odontestis potatoria*, *Lasiocampa quercus*, *Arctia villica*, and *A. caia*, with a view of obtaining varieties. I may mention that I have been fairly successful in this respect, this being specially the case with *A. caia* and *O. potatoria*. I would also point out that it has been my invariable custom to turn loose all type-specimens in the haunts where I find the larvæ, so that the scarcity of both, last season and this, cannot be put down to over-collecting as far as I am concerned. For instance, last season, rearing over one hundred *A. caia*, I only set eleven, all the rest being turned loose. Probably the numbers of these four lots of larvæ obtained, and a few comments, may be of interest. *Odontestis potatoria*.—In 1902 I took one hundred and twenty-three larvæ; in 1903, one hundred and seventy-one; in 1904, sixty-three; in 1905, sixty-seven; in 1906, nineteen; and this year, to date, only three. *Arctia villica*.—In 1902, forty-nine larvæ; in 1903, one hundred and six; in 1904, twenty-five; in 1905, fifty-one; in 1906, none; and this season, twelve. Last season these larvæ seemed quite extinct, yet they could not have been, as my son took six imagines. This year it seems to be appearing again, as we have taken twelve, as mentioned above, all of which have fed up well and have now pupated. *Lasiocampa quercus*.—In 1902, one hundred and sixty larvæ; in 1903, one hundred and six; in 1904, seventeen; in 1905, ten; in 1906, one; and this year, to date, one. This species was very abundant in the seasons 1902–3, but, though feeding up well and spinning up apparently healthily, very few of the larvæ pupated, but died in the cocoons. One or two correspondents, to whom I sent a few larvæ, confirmed my observations in this respect. Since 1903 *L. quercus* has been very scarce around here. *Arctia caia*.—In 1902, ninety-five larvæ; in 1903, two hundred and ninety-eight; in 1904, three hundred and seventy-four; in 1905, five hundred and thirty-one; in 1906, one hundred and seventeen; and this year sixty-four. In 1902 I bred some very nice varieties, nearly all dark; and in 1903, four specimens with lemon-yellow under wings, and another with a broad white line right across the thorax. Since then there has been nothing very special. The larvæ this season are all doing well and look healthy. To turn to another matter—my son took a nice specimen of *Smerinthus ocellatus* on a lamp to-day; is not this rather early for this insect?—H. HUGGINS; 13, Clarence Place, Gravesend, May 16th, 1907.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, May 1st, 1907.—Mr. C. O. Waterhouse, President, in the chair.—M. Alexandre Bonnet, of 36bis, Boulevard Bineau, Neuilly-sur-Seine, Seine, France; Mr. Henry Murray Giles, of Perth, Western Australia; Mr. Arthur Leslie Raywood, of Colebrooke, Park Lane, Wallington, Surrey; and Mr. Yeend Duer, of Tokyo, Japan, were elected Fellows of the Society.—The decease was announced of the Rev. William Henry Heale, M.A.—

Mr. O. E. Janson exhibited a small collection of Coleoptera, made by him in Iceland in July, 1908, comprising thirty-nine species, of which some were previously unrecorded as inhabiting that island. He also drew attention to the affinity between the beetle fauna of Iceland and of Scotland, only one of those taken, *Colymbetes grœnlandicus*, Aubé, not occurring in both countries.—Mr. J. A. Clark brought for exhibition living larvæ of *Otiorrhynchus sulcatus* feeding on the roots of ferns.—Commander J. J. Walker showed living specimens of *Oxythyrea stictica*, L., *Epicometis hirtella*, L., and *Anthaxia parallela*, taken by Dr. T. A. Chapman at St. Maxime, Var, S. France.—Dr. F. A. Dixey exhibited specimens of seven different forms of the variable female of *Leuceronia argia*, Fabr., showing that each form stood in mimetic relation with a separate model.—The President, some Coleoptera collected in Pahang by Mr. H. C. Robinson and recently received at the Museum. The series contained some interesting cases of mimicry between beetles of widely separated groups.—Dr. G. B. Longstaff, living specimens of the Elaterid *Pyrophorus noctilucus*, Linn., brought from Trinidad by Dr. F. L. J. M. de Verteuil, R.N.—Mr. H. St. J. Donisthorpe, on behalf of Prof. T. Hudson Beare and himself specimens of *Quedius riparius*, Kell., and *Trypodendron quercus*, Eich. taken by them at Porlock, Somersetshire, on April 16th and 17th also *Hydrovatus clypealis*, Shp., taken on April 14th at Worle, near Weston-super-Mare.—Mr. Donisthorpe also showed the larva and pupa of a Dipteron of the genus *Microdon*, taken in a nest of *Formica fusca* at Porlock last month. A number of larvæ were taken, and on the nests in which they occurred.—Mr. R. Shelford exhibited a specimen of the curious Orthopterous insect *Hemimerus talpooides*, Walk., from Portuguese Guinea, and read a note on "A Case of Homeotomic Variation in a Cockroach."—H. ROWLAND-BROWN, Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

March 28th.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Main exhibited specimens of the mole flea *Hystricopsylla talpæ*. On behalf of Mr. Alderson, specimens of *Musca domestica*, bred from maggots expelled from the intestines of a child. This was said to be the first time that the species had been properly identified, although similar occurrences had been previously reported.—Mr. Adkin, several series of *Anchocelis rufina* from various localities, those from Rannoch being the most richly coloured.—Mr. Montgomery reported *Pieris napi* as flying in mid-March.—Mr. Newman, *P. napi*, *P. rapæ*, and *Vanessa atalanta*, as being common in South Devonshire.

April 11th.—The President in the chair.—Mr. Lucas exhibited the rare Entomostriatan, *Chirocephalus diaphanus*, found in water in carts at Claygate.—Mr. South, preserved larvæ at different instars of *Castropacha quercifolia* and *Epicnaptera ilicifolia*, and discussed the orange markings present on the second and third segments; also cocoon of the latter species and of *Lælia cenosa*.—Mr. Tonge, photographs of the cocoons of *Dicranura bicuspis* among lichen and of larva of *Charaxes jasius*, showing the peculiar conformation of the head. Mr. West, the rare Coleopteron, *Oxylæmus variolosus*, from Dartmouth Wood, in August, 1908. The species is rare on the Continent. Mr. Newman, a long bred series of *Polygonia c-album*, repre-

sentative of some seven hundred, showing but trivial variation.—Mr. B. Adkin, a bandless form of *Anaitis plagiata*, a *Eupithecia pumilata* with only two transverse lines, with nice forms of *Camptogramma bilineata*, and other species.—Mr. Kaye, a bred series of *Daphnis nerii* from Dalmatia.—Mr. Adkin, a series of *Cymatophora duplaris* from Rannoch, and contributed notes on the two very distinct forms. Mr. Adkin made some remarks upon insects attacked by verdigris, and a discussion ensued, Messrs. Montgomery, Kaye, South, and others taking part.—Mr. Turner, the butterfly-like moth *Synemon parthenoides*, the sexually very dimorphic *Heteronympha merope*, and other insects from West Australia.—Mr. Bayward read notes on the curious relations he had observed between ants (*Formica flava*) and the larvae of *Polyommatus icarus*, and gave details of his experiments.

April 25th.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Newman exhibited a branch of birch, upon the twigs of which were about a thousand ova of *Dimorpha versicolor*, laid by females sleeved around it.—Mr. Main, some small scorpions, the larva of a Mantis, and an example of the large *Acridium aegypticum*, all living, and sent him from Hyères by Dr. Chapman.—Mr. Sich, the ova of *Lithoclellis concomitella*, a species closely allied to the more common *L. pomifoliella*.—Hy. J. TURNER, Hon. Rep. Sec.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—This, the concluding meeting of the session, was held at the Royal Institution, Colquitt Street, Liverpool, on April 15th, 1907.—Mr. W. Mansbridge, F.E.S., Vice-President, in the chair.—Mr. Robert Newstead, F.L.S., F.E.S., lecturer on economic entomology and parasitology at the Liverpool University, delivered a lecture upon the Tse-tse flies (*Stomoxys*) and the Glossinæ, the latter being the insects which produce sleeping sickness. The lecturer described the life-history and development of these most interesting flies, giving particulars of their habits and distribution, as well as the structural characters available for classification. The life-history of *Stomoxys* remained unknown until worked out by the lecturer, partly upon captive specimens, verified by his discovery at Rossett, last year, of the fly in every stage. The flies were found laying their eggs upon heating grass mowings, and feeding upon the warm decomposing grass were embryos in all stages of development. The mouth parts, which form the biting organ, were very fully described by Mr. Newstead, and illustrated by blackboard drawings and microscopic preparations of these—in many respects—remarkable flies. Specimens of eight out of nine known species of the Glossinæ were exhibited by the lecturer, together with preserved larvae and pupæ, which had not previously been seen in public, the whole showing in a remarkable way Mr. Newstead's great powers of observation and patience in working out the minute details of these previously little known life-histories.—Mr. Joseph Collins, of Oxford, sent for exhibition a box of Coleoptera and Diptera taken from moles' nests in the vicinity of Oxford, and contributed notes. Working on lines suggested by the researches of Dr. Joy, of Reading, Mr. Collins found the following species, all of which were shown, viz., *Quedius vexans*, common; *Q. longicornis*, a short series, much rarer than *vexans*; *Aleochara spadicea*, fairly common; *A. succicola*, *Heterothops nigra*,

common; *Oxypoda spectabilis*, not common; *O. metatarsalis*, in two localities, a nice series; *Homalota paradoxa*; *Oxytelus fairmairii*; *O. sculpturatus*; *Medon castaneus*; *M. propinqua*. Diptera: *Hystrichopsylla talpa*, the mole flea.—Mr. W. A. Tyerman exhibited a long bred series of *Tæniocampa gothica*, which had fed on lilac; and preserved larvæ of *Odontopora bidentata*, showing protective resemblance to the lichen commonly found on birch-bark.—Mr. Oscar Whittaker living examples of *Plea minutissima*.—H. R. SWEETING and Wm. MANSBRIDGE, *Hon. Secs.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—April 15th, 1907.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. E. C. Rossiter showed *Tæniocampæ*, bred from dug pupæ from Wyre Forest; amongst them were specimens of *T. incerta* which approached *T. stabilis* so nearly that he was uncertain to which species to assign them.—Mr. Hubert Langley, various Lepidoptera from the neighbourhood of Leamington, including *Sarrothripus revayana*, Sc., taken on sallow bloom and new to Warwickshire, and dark forms of *Hybernia marginaria*, Bork., female, *H. leucophaearia*, Schiff, and *Chimabache fagella*, F.—Mr. J. T. Fountain, a large number of Lepidoptera taken already this year, including live *Biston strataria*, Hufn., taken that day at Sutton, *Panolis griseovariegata*, fine specimens from Sutton, *Vanessa polychloros* and *Polygonia c-album* from Wye Valley, &c. He remarked on the extraordinary resemblance of the *Panolis* to bits of fir cone with which the ground was plentifully bestrewn by birds or squirrels, and amongst which they were taken.—Mr. L. Doncaster, the specimens of *Angerona prunaria*, L., reared by him in the course of his breeding experiments upon the species, the results of which he explained.—Mr. G. T. Bethune-Baker, a series of the magnificent butterflies belonging to the Morphinæ, genus *Tenaris*, from New Guinea.—Mr. C. J. Wainwright, Lepidoptera taken by Mr. W. H. Hardaleer, including *Noctua castanea* (*neglecta*) from Sutton, *Hadena trifolii* (*chenopodii*) from Handsworth, &c.—Mr. G. H. Kenrick remarked that the *castanea* were neither of the Southern grey form nor the Northern reddish form, but of an intermediate brownish colour, and that he had taken similar specimens at Wyre Forest.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

A Natural History of the British Alucitides: a Text-Book for Students and Collectors. By J. W. TUTT, F.E.S. Vol. i. [vol. v. Nat. Hist. Brit. Lep.], pp. i.—xiii, 1—558. London: Elliot Stock. Berlin: Friedländer & Sohn. 1906.

To anyone who has hitherto regarded the "Plumes" as a number of closely-allied species, differing principally among themselves in colour and markings, vol. v. of Mr. Tutt's 'British Lepidoptera' will come as nothing less than a revolution with all its horrors. To the earnest student, however, who, though unacquainted with all the minutiae of the structure and of the life-histories of the different species, has yet become cognisant of the really wide separation which

exists between many species which authors have hitherto lumped together in the same genus, this book will be a revelation and a delight.

The author divides the Plumes or Alucitids into two superfamilies, the Agdistides and the Alucitides, the former containing—as far as Britain is concerned—only one species, *Adactylus bennetii*, while the latter includes all our other Plumes (except *Orneodes*, which is not an Alucitid at all). The Alucitides are again divided into two families, the Platptyliidae and the Alucitidae. This division is a very natural one, and the characters marking these two families are apparent in the ovum, larva, pupa, and imago.

It is true the present volume only deals with the Agdistides and the first family of the Alucitides, some twenty species; but if we have such a detailed account of these species in volume v., we may hope for an equally good account of the remainder subsequently. As the author rightly points out, Zeller and O. Hofmann are the authorities on which the student of the Palæarctic Alucitids places most reliance. The former seems to have had an unerring inspiration in discovering and defining the different species, while the latter possessed a marvellous talent of grouping the species by their affinity. Authors, in fact, except Hübner, Zeller, and Wallengren, up till the time of the publication of Hofmann's 'Die deutschen Pterophinen,' appear to have treated the Alucitids somewhat like bits of glass in a kaleidoscope, and each one shook them up till they formed a pattern to his own liking; some continued the process even after 1895, ignoring Hofmann's splendid work.

In the present volume the classification of the Alucitids has been carried very much farther, and all the known facts employed in this process are placed at the student's service. The affinities and differences displayed by the ovum, larva (in all its instars), the pupa, and the imago, as well as the divergency shown in the life-history and habits of each species, are all taken into account. This has unfortunately necessitated the creation of several new genera, a fresh burden on the entomologist's memory. The origin of the Alucitids is well discussed in all its bearings, but as yet no sufficiently clear light has been thrown on this problem, and it seems to be a question as to whether the connecting links between the more generalized ancestors of the Alucitids and the species now existing on the Earth have not, one and all, been entirely swept away. Perhaps when the Micro-Lepidoptera of the Tropics, and especially of Australasia and other more or less untouched regions, have been thoroughly worked out, we may become acquainted with forms of Alucitids, more generalized than we now know, which will throw a clearer light on the origin of the group. Though this volume deals especially with British species, it treats of them on such broad lines that incidentally it contains a good deal of information on palæarctic species which have not yet been discovered in the British Isles. This feature is particularly noticeable in the account of the Agdistides, of the Stenoptiliinae, and Oxyptilinae. The account of the general biological characters of the Alucitids, occupying twenty-five pages, and containing a most useful tabulation of the chief larval characters of most of the larvæ, is

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There is a deal with the larva and pupa. No attempt to have been made, in dealing with the usually dark, club-shaped scales which lie in the second plumule of the hind wings, mostly obscure & observable on the under side of the hind wings as well as in the Alucitids.

When separate species come to be considered, the minute details which are here found recorded are excellent work which has been so successfully carried out by the author and his collaborators. Firstly we have the list of authors who have previously written on the general description of the imago, which is followed by the species in all its stages, its life-history, times of appearance, & the localities where it occurs. The larval and pupal stages are referred to the colours and markings, as so many, minute descriptions are, but are carried out in such detail that all outward structural peculiarities being described, the position of the tubercles, their setæ, the presence of long, bristly hairs, and other details. Thus the description of *Adkinia pterodactyla* extends to six pages, whilst the pupa occupies two additional pages. Everyone knows that but how few know where and how the young were found. A perusal of the account of the imago of *Adkinia* will suffice to show how completely all the observations have been digested and tested. In reading the descriptions, however, we frequently find no mention made of the wings, this is, of course, a highly essential structure, and should well be noted.

One of the most startling discoveries concerning the life-history was made in 1904 of the food-plant of *Buckleria*. The detailed account of this species is exceedingly interesting. We have yet, however, to learn whether the larva can live by feeding on *Drosera*—whether, for instance, the sticky hairs of the larva may sometimes be foiled in their attack on the similar hairs of the plant.

There remains, besides the natural history of the Alucitids, the question of the hybridization and mongrelization in

the genus. These are now so well known and appreciated by all that it appears quite unnecessary to call attention to them. The amount of original research contained in the present volume certainly equals that of any of the previous volumes, and we have such a truly excellent account of the Alucitids that we may hope that, in the course of species now dealt with, that this volume will be the standard work on the subject, and must ever be the starting-point in the future to write a history of the

A. S.

In Vol. 11, for "Italy" read "July."



A. Nymph ♀.

B. Imago ♀.

PULCHRIPHYLLIUM CRURIFOLIUM, Servith.

C. Imago ♂.

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[No. 530.

LIFE-HISTORY OF *CHYSOPHANUS DISPAR* VAR.
RUTILUS.

By F. W. FROHAWK, M.B.O.U., F.E.S.



Gynandrous *Chrysophanus dispar* var. *rutilus*.

THROUGH the kind assistance of the Hon. N. Charles Rothschild, I received from Austria three living females of *Chrysophanus dispar* var. *rutilus* on June 4th, 1906; these were at once fed and placed on two growing plants of the great water-dock (*Rumex hydrolapathum*). The following day I found a few eggs were deposited, and many more were daily laid for about a week. On the 15th I examined the plants and counted 202 eggs had been deposited on one plant by two females, and 140 on the other, the production of one female. I then put the latter female on a plant of common dock, upon which she deposited 21 more eggs, having altogether laid 161. The two other females I placed on another plant of *R. hydrolapathum*: these again deposited a further supply of eggs, amounting to 50 more, making 252 by the two females; the three parents produced in all 413 eggs. They lived in captivity for about three weeks, and continued depositing during the greater part of the time. The eggs are laid singly and scattered over both surfaces of the leaves, sometimes laid in little groups of three or four. They are small in proportion to the butterfly, being only slightly larger than *C. phleas*, measuring only $\frac{1}{40}$ in. wide and $\frac{1}{70}$ in. high. It is shaped like a coronet, with a bold cellular pattern on the

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which is surrounded by about 100 (in different specimens) crescentic cells; and the same number of much larger ones, which become very much less, almost reaching the base, which is somewhat rounded. The cells are well developed, and form a fairly regular flower-like arrangement, those below the bulging ones being smaller. The surface is finely granulated, oxidized silver with shadows of black. The body is shining transparent green; it is covered with a glutinous, adhering it firmly to the leaf, and turns to an opaque creamy white when hatched on June 21st, remaining in the shell for a few hours. The young larva emerges by eating a hole in the shell, and does not feed on the shell after leaving it, but makes a hole to allow its escape.

When the larva measures only $\frac{1}{2}$ in. long, it is pale-yellow with pale amber-brown markings on the face, and black eye-spots; the head is broad and projecting in front, overlapping the segments humped dorsally, sides sloping down to a dilated, lateral ridge. Along the sides are rows of very long, white, finely serrated hairs, one segment closely placed, all curving outwards; the segments along the lateral ridge are shorter, and projecting laterally, and slightly curving outwards; a projecting fringe all round the larva; the body is covered with short, whitish, simple hairs; on the head are short, minute, brownish hair with a few still smaller white ones on the side, and a black spiracle: above the black spiracle is a black spot. The entire surface is a light citrine-yellow with granulations.

After hatching from the egg it crawls to the under surface of the leaf, and cuts through the cuticle and lies in the furrow eaten out of the leaf, and makes a row of hairs lying flat on the surface of the furrow. After making a little furrow, it cuts a groove, and then cuts another, and so on until it has made a series of furrows of various lengths are cut in the leaf, but they do not leave a thin membrane on the upper surface. The leaf is curled over so as to leave the under surface exposed, and they then feed on the upper cuticle; there is no preference for which surface they feed, so long as there is food. They crawl rapidly, and appear to be con-

(To be continued.)

NOTES ON THE REARING OF LEAF-INSECTS IN CAPTIVITY.

By W. H. ST. QUINTIN, F.E.S., &c.

(Continued from p. 75.)

(PLATE IV.)

ON March 15th the first female imago appeared. Two days later it was seen pairing with one of the males. The first ova were laid on April 1st. As the ovum is being laid the insect bends its abdomen back, and suddenly straightens it, releasing the egg at the same time, which is jerked to some distance. Some of the females on a bush, not enclosed in the cage, fling their ova about the small stove-house. One egg was found on the opposite stage across the gangway that runs down the middle of the stove; another was shot on to the stage in the corner of the house four feet from the *Ilex* plant. The purpose is probably to ensure the distribution of the offspring.

Both males and females in the perfect state continue to feed freely. In the female the under wings are rudimentary, and the most that she can do with her large leaf-like elytra is to ease the force of an accidental fall. The male, on his gauzy wings, is quite capable of a flight of at least a few yards, and is altogether a much more active, sprightly insect than the female. After dark the males flew from side to side of the cage with such violence that we were careful not to show a light near them, lest they should injure themselves if disturbed.

Of the insects reared, about one-half were of each sex. The first male assumed the imago state about a month before the first female, and I have a note that, after less than another month, the males began to die off. At the present date (May 18th) only one male remains alive. This one has been seen to pair with three different females, and is still feeding and lively. I have already over three hundred and fifty eggs, and shall be very pleased to present some to any of your readers who would like to rear these very interesting insects. Anybody who can ensure a moist atmosphere and a temperature not less than 65° Fahr. should succeed. I hope to prove, in the coming season, whether, as is the case with *Bacillus*, *Phyllium* is able to continue its species by parthenogenesis.

For the figures I am much indebted to my friend Mr. Digby Legard.

EXPLANATION OF PLATE.—A, a female nymph; B, an imago, also female; C, a perfect male. I regret that I did not think in time of securing photographs of the male in the earlier stages. If successful again this year I shall remember this omission.

DESCRIPTION OF A NEW GENUS AND SPECIES OF
THE SUBFAMILY CLYTRINI (PHYTOPHAGOUS
COLEOPTERA) FROM AUSTRALIA.

BY MARTIN JACOBY, F.E.S.

LEASIA, gen. n.

Elongate, parallel; head very broad, without distinct epistome; eyes oblong, rather small, entire; mandibles broad and robust, strongly pointed; antennæ with second and following joints submoniliform, gradually widened, terminal joints slightly broader than long. Thorax transverse, more than twice as broad as long, sides nearly straight. Scutellum ovate. Elytra punctate-striate, with rows of fine hairs. Legs short and robust, tarsi short, the first joint slightly longer than the second, claws simple. Prosternum very narrow and elongate.

This is the second genus and third species of the subfamily Clytrini known from Australia. It forms part of the group *Megalostoma* of Lacordaire, and bears a close resemblance to the South American genus *Megalostomis*, from which it differs in the shape of the head, which forms a single frontal surface without the slightest depression; the antennæ, instead of being serrate as in *Megalostomis*, are simply thickened. An enormous contrast is presented by the extraordinary small size of the insect, being one of the smallest, if not the smallest, of all the Clytrini; while, on the other hand, *Megalostomis* is represented by insects of the largest size of that group.

The species has been sent to me by Mr. A. Lea, the curator of the Entomological Department of Hobart Town, who has lately contributed a valuable monograph of the Australian *Cryptcephalini*, and after whom I have named this genus.

Leasia australis, sp. n.

Black; antennæ, tibiae, and tarsi more or less fulvous. Thorax impunctate, opaque; elytra more shining, minutely punctate-striate, with rows of fine pubescence. Length, 2 mm.

Hab. Karridale, North Australia.

Head impunctate, opaque, anterior edge of clypeus trisinuate, labrum fulvous, mandibles robust; antennæ extending to base of thorax, fulvous, sixth and following joints widened but not serrate. Thorax more than twice as broad as long, sides nearly straight, very narrowly margined, median lobe of basal margin scarcely produced, surface black and opaque like head, with some minute widely dispersed punctures. Elytra with very fine and closely arranged rows of punctures, and extremely fine and short hairs likewise arranged in rows (only visible in well-preserved specimens); legs and tarsi sometimes more or less fulvous.

Male.—Head and thorax very broad, mandibles robust.

Female.—Head much narrower, mandibles very small.

BUTTERFLIES OBSERVED DURING A SHORT TOUR
IN SOUTHERN FRANCE IN MAY, 1907.

By H. ROWLAND-BROWN, M.A., F.E.S.

It has not been my experience before to make a prolonged entomological tour in the month of May on the Continent, and this perhaps lent additional zest and pleasure to my last visit to France. For some years past I have been endeavouring to collect material relative to the distribution of the Macro-Lepidoptera throughout this country, but, though I have been fairly successful, there are still many absolute blanks upon the map which registers the departments for which no records exist, or for which I have been able to get no permanently valuable information. My chief uncoloured areas embrace the eastern frontier departments from Ardennes to Haute-Saône, the country lying westward of the Cevennes and south of Cantal, and a wide field in Central France, stretching chiefly in a south-easterly direction. But it is only necessary to traverse these last two regions by day to understand the reason for the paucity of entomological references. Great plains, with every square acre of land cultivated and husbanded with such care as can only be seen in a country of peasant proprietorship—a scarcity of woodland enclosures, and of trees in general—these conditions offer little attraction to the entomologist who concerns himself chiefly with such insects as are not merely “nuisibles.” Yet, I dare say, round Limoges, the reputed northern limit in the west of *Chrysophanus* var. *gordius*, and in the warm upper valleys of those tributaries of the Dordogne, the Lot, and the Tarn, there are innumerable hunting-grounds lying unexplored, as there are picturesque towns and old-world villages hardly known to the majority of Frenchmen themselves.

The day I left Paris for Rocamadour—May 3rd—was unpromising enough, and not until sunset did the skies clear, as I fondly imagined, for the familiar unbroken blue of the “Midi.” But next morning, when I woke to as perfect a spring day as ever inspired the poets of Guienne, I was not a little surprised to find vegetation hardly more advanced than I had left it in England; the poplars in the deep warm valley of the Alzou were still greener with the mistletoe, which especially affects them, than with their own foliage; the vine-tree over the door of the delightfully primitive hotel had hardly broken bud, and I was hailed as the first tourist. The sunny slopes of the ravine, to the side of which clings this interesting village, were, however, clothed with wild flowers, and here and there great bushes of the giant-fennel, suggestive of *Papilio machaon*; while the several platforms in the rock which mark the pilgrim-road for the faithful

to the shrine of St. Amadour were golden with a tiny dwarf hawthorn. But *machaon* I did not meet with, though *P. podalirius* was almost the first butterfly to greet me, with a plenty of *Gonepteryx cleopatra*, *G. rhamni*, some immense *Pieris brassicae*, *Pontia daplidice* var. *bellidice*, *Anthocharis belia*, and a number of *Colias ethusa* and *C. hyale*, of which latter species I was particularly anxious to observe the female in the act of ovipositing; but for some perverse reason all the *hyale* here appeared to be males. In addition, I also noted fresh *Pararge megaera*, and one *P. mera*, with occasional *C. phœbe*, *Polyommatus icarus*, *Nisoniades tages*, and one or two hybernated *Eugonias polychloros* flying over the bay-trees in the chapel garden. But above on the *causse*, or plateau land, and during a drive of some two miles or more to the nearest station, though the day was brilliantly fine, there was nothing on the wing. Indeed, the barren rocky wastes, grazed (?) by sheep of the type familiar to the Noah's ark of our childhood, and the origin of the heady Roquefort cheeses, were suggestive of anything but an abundant butterfly fauna.

After leaving Rocamadour my entomological diary received no additions worth recording for some days. The weather became cool, overcast, and windy, than which climatic conditions there are none more trying to the patience and the temper of the collector. From Albi I moved on to Toulouse, where it poured incessantly, and from Toulouse I passed on to Montpellier, intending to collect for a day or two in a country which appears to have been somewhat carefully investigated by French collectors about thirty or forty years ago. The weather, however, was again abominable, though I had a lovely day at Carcassone (May 6th), where I noticed, in the dry moat of the famous *Cité*, a few specimens of *Carcharodus althææ*, and *P. podalirius* not uncommon over the sloe-bushes. My first successful day, indeed, did not come before the 10th, when I found myself on the *voiture publique*, which conveys tourists to and from the Pont du Gard to Remoulins Station, reached from Avignon. But the backwardness of the season was very apparent as soon as I had dismounted and unfurled my net for a preliminary hunt in the little glens, and on the undulating waste lands which lie to the south-west of the Gardon. The forest-trees were as yet hardly in leaf. But all the slopes were glorified by great streams of full-flowering asphodel, flowing and overflowing from the sunny uplands, and a tall yellow *Senecio*. It was, however, in the valleys that such butterflies as I found occurred, and among them *Thaïs* var. *medesicaste*, males for the most part, and in absolutely fresh condition. *Euchloë euphenoides*, very small, both male and female, were flitting about the *biscutella* plants, with here and there an occasional *E. cardamines*. *Melitaea cinxia* also was well to the fore and fine, and a few *Leucophasia sinapis*. But, to my complete surprise, when I crossed the bridge and

ascended to the ground above the Pont, there was hardly a butterfly to be seen where, on the last day of March, 1902, the ground was alive with all the spring butterflies. I made my way back, therefore, very soon to the opposite bank, but *Hesperia sidæ* was evidently not out, and only a few worn *Callophrys rubi*, *Polyommatus baton*, and *Pontia daplidice* var. *bellidice* put in an appearance. The next day at Avignon, in a quarry near the Ville-neuve, *M. phœbe* was just emerging, and in the citadel garden I noticed *Papilio machaon* for the first time.

Leaving Avignon on the 11th, I found myself that evening once more back in the 'Boyer-Mistre' at Digne, which hotel, I may add, for the benefit of intending visitors, has been very much smartened up, the electric light installed throughout, and the sanitary arrangements completely overhauled. Madame Mistre, known to so many British entomologists, has retired, however, from the immediate management of the house, but their comforts will not be overlooked. As on the plains, still more conspicuous in the Basses-Alpes, was the lateness of the season. The plane-trees were only just beginning to leaf, the willows and the lesser forest-trees barely clothed with green, though I did find more favoured places, notably on the little rent in the hills which is the butterfly-hunter's staircase to La Collette—and fine collecting ground all the way up—situate to the left of the Dourbes Road, about half a mile from the Octroi. Here *Melitæa aurinia* var. *provincialis* was abundant, with occasional *M. cinxia*, *M. phœbe*, *Brenthis euphrosyne* (large and fiery), and females of *B. dia*, the first brood of which, in the ordinary course of events, comes in late March. Again, on the top of the hill, on the sweet-scented wild thyme, I found a single belated *Erebia epistygne*, female. My chief reason for ascending to the summit was *Anthocharis bellizina* var. *tagis*, and I actually bagged a couple of specimens within five minutes, though on that and a second climb I never saw this dainty little butterfly again; nor was it apparently emerged on the foot-hills of the Doubs, where, I am given to understand, it occurs not infrequently. *Pontia* var. *bellidice* was, however, common, *Anthocharis belia* evidently on the wane, and both males and females of *E. cardamines* common, the latter especially so, as it seemed, for I was netting every Anthocharid, without an orange tip, that crossed my path in hopes of securing the elusive *tagis*. But by far the commonest insect on the wing was *Nomiades cyllarus*, which simply swarmed in the little damp gully just off the Dourbes Road, and also in the dry bed of the stream which runs down the Eaux Thermale valley. With them were occasional males of *P. bellargus*, in all the splendour of an early emergence, not a few *N. melanops*, the males still perfect, and here and there single specimens (all males) of *P. baton*, *C. sebrus*, *Erias argiades*, and *P. icarus*. *Leucophasia duponcheli* was, however, decidedly rare wherever it occurred, and, as my half-dozen captures were

that I estimate that the species this year was especially rare, and, after reaping a good deal also of the growing scarcity of the butterflies in the hands of local dealers, it was pleasing to find that even in its old haunts there were plenty flitting about in the neighbourhood of the *aristolochia*, and quite a number in the park of the Eaux Thermales Hotel, where I do not believe I have encountered it in previous years. It is interesting to observe, I think, that wherever *Gonopteryx rhamni* was to be found there was a mixture both males and females of *G. rhamni* and *G. urticae*. In the "aleuron valley," a little above the *Col de la Fourche*, however, known to most of our collectors, there was a general scarcity, and the stream for the greater part of the way was still monopolizing the pathway from which later in the year I have taken so many interesting species. But here there was a fine male *Erebia erias*, in magnificent condition, though a few days later it was much commoner on La Dourbe, flying easily about just beyond reach of the net as a rule, in the steep precipice which falls away from the summit of the valley hill. Yet it was by no means confined to "the tops," and I noticed several—the single female I took on the 16th winging about in the river-bed itself. At the foot of the hill in *Col de la Fourche* I also saw a solitary male *Carcharodus lavaterae*, *H. H.* being commoner further along the Dourbes Road with the sun higher up in the woods—the only butterfly observed here *A. meleagris lacerta*, which again was very common in most of the coppices and wooded slopes round Digne, now beautiful with flowering cypress, the wild medlar, white hawthorn, and a sweet-scented golden Jessamine, familiar to me as a garden shrub in England. Not more than I have no doubt my list of captures would have been considerably longer; as it was, I had one whole wet day in the *Col de la Fourche*, and four at least when the wind was high and the wind precluded much success among the butterflies. I append, however, a list of the species actually met with in the various places visited, in the hope that it may serve as some indication to those who in the future find themselves in the regions hurriedly toured by me at this particular season of the year.

— *Papilio podalirius*, *Pieris brassicae*, *Pontia daplidice*, *Colias edusa*, *C. hyale*, *Gonopteryx rhamni*, *G. tenebricosa*, *Eugonia polychloros*, *Pararge mæra*, *P. c. cypriana*, *Lycaenidae* *caerulea*, *Chrysophanus phœas*, *Nisoniades*

— *Thaïs* var. *medesicaste*, *Euchloë eu-*
medesicaste, *C. cleopatra*, *C. edusa*, *Leptosia sinapis*,
Leptosia sinapis, *P. luteus*, *Upido minima*, *P. baton*, *Callophrys*

P. machaon, *A. belia*, *P. var. bellii*, *A. lycia* *urtice* (apparently just out by the

freshness of the specimens ?), *Pyrameis cardui*, *M. phœbe* (May 10th).

DIGNE (Basses-Alpes).—In addition to all the above, *Carcharodus lavateræ*, *C. althææ*; (and at Carcassone, Aude), *Hesperia alveus*, *H. malvæ*, *Pyrgus sao*, *Chrysophanus dorilis*, *Nomiades semiargus* (1), *N. cylarus*, *N. melanops*, *Polyommatus bellargus*, *P. hylas*, *Everes argiades*, *Cyaniris argiolus*, *Nemeobius lucina*, *Pieris rapæ*, *P. napi*, *L. duponcheli*, *A. tagis* var. *bellizina*, *Brenthis euphrosyne*, *B. dia*, *Melitæa aurinia* var. *provincialis*, *Euvanessa antiopa*, *Pararge egeria*, *Cænonymphæ pamphilus*, *Erebia erias*, and *E. epistygne*—being representative of fifty-three species in all.

Harrow-Weald : June 5th, 1907.

COLLECTING LEPIDOPTERA IN THE LAKE DISTRICT
IN 1902, 1903, AND IN 1905, 1906.

BY A. H. FOSTER.

(Concluded from p. 133.)

On Lingmoor *Larentia cæsiata* swarmed, as indeed it did on the rocks on all the mountains visited. Another very common insect everywhere was *Hypsipetes sordidata*, showing every grade of variation, from greenish or grey to totally black, the darker specimens being the commonest. Other insects taken on the heather were:—*Chelonia plantaginis*, *Venusia cambricaria*, *Acidalia fumata*, *Strenia clathrata*, *Fidonia atomaria*, *Oporabia filigrammaria*, *Larentia didymata*, *L. salicata*, *L. olivata*, *L. pectinifaria*, *Eupithecia nanata*, *Cidaria immanata*, *C. russata*, *C. testata*, *C. popula*, *Charæas graminis*, *Calæna haworthii*, *Agrotis porphyrea*, *Anarta myrtilli*, *Plusia gamma*, and *Euclidia mi*. During our last week in 1902 we sugared some trees near the edge of Blea Tarn with great success, the most important insects obtained being *Xylophasia lithoxylea*, *X. monoglypha* (a nearly black variety in abundance), *X. rurea* and var. *combusta*, *Mamestra furva*, *Apamea gemina*, *A. didyma*, *Noctua festiva*, *N. rubi*, *Polia chi* and var. *olivacea*, *Aplecta nebulosa*, *A. tincta*, *Hadena adusta* (dark), *H. pisi* (dark), and *H. oleracea* (dark).

Dusking near Blea Tarn in 1902 produced *Nudaria mundana* in abundance, and this insect also came to light.

The next season (1903) we could find nothing of any importance at sugar, and *N. mundana* was absent, though there was only a week between the dates in the two seasons. *E. epiphron*, however, was abundant both in 1902 and 1903.

In 1905 and 1906 I went to a farmhouse at Stool End at the foot of Bow Fell. I was there for the first fortnight

THE ENTOMOLOGIST.

and the last fortnight of August in
there were none, *P. interrogationis* none,
was very abundant in both years. This
common on the rocks on Bow Fell, but is
detected by walking along the stone walls, when,
about near the wall, the insect flies off, and is
Another insect which I took on Bow Fell (and
Lacordaisa sericeinctata, which was obtained
in the same manner. Both these insects are
abundance of *L. caesiata*, and it is necessary
every possible insect which flies off in case it may be
which is the insect to be despised.

... also discovered that the large patches of juniper
... were still in Lingmer, Bow Fell, and elsewhere were
... found a new but similar hairy variety of *Eupithecia sobrinata*,
... which I met the same insects again in 1906. In the latter
... year (I saw the specimens and missed two others) of *Thera*
... I saw juniper at Bow Fell, but did not meet with it

—בְּנֵי יִשְׂרָאֵל אֲנַתְּנֵנִי—

in which I took three specimens, all kicked
about in the long grass—one on Bow Fell, one on
the grassy moor.

which occurred in 1902 and 1903 chiefly in the mountains in company with *E. epiphron*; I did not mention, though I searched several times

fairly plentiful among bracken and in long grass and tops of high mountains.

occurred every year in small numbers, chiefly in the clefts in which the sides of the fells, where there are over-

which occurred abundantly everywhere, particularly in the bushes. This is noticeable as occurring almost exclusively in the blue lilac variety. I took no yellow ones.

... with *Erebia blandina* nor *Coenonympha* ... with the variety of *E. epiphron* in which the black ... white patches of var. *cassiope*, or is this the type and ... is this *epiphron* and the one without ...

menthastris, *Macrothylaria (Bombyx) rubi* (larvæ), *Boarmia repandata* (dark), *Hemithea strigata*, *Eupithecia vulgata* (dark), *Melanippe substristata*, *M. montanata*, *M. fluctuata*, *Camptogramma bilineata*, *Tanagra atrata*, *Notodonta dictyoides*, *Leucania impura*, *L. pallens*, *L. conigera*, *L. lithargyria*, *Mamestra brassicæ*, *Agrotis segetum*, *A. exclamationis*, *Triphaena pronuba*, *T. orbona*, *Noctua xanthographa*, *Phlogophora meticulosa*, *Euplexia lucipara*.

13, Tilehouse Street, Hitchin.

DESCRIPTION OF TWO NEW SPECIES BELONGING
TO THE FAMILY NYMPHALIDÆ.

BY EMILY MARY SHARPE.

Euryphene braytoni, sp. n.

♂. Fore wing bluish black, the central area metallic blue, costal and hind margins brownish black. The dark apical area relieved by a transverse band of three white hastate spots suffused with pale blue. Hind wing entirely metallic blue, the costa, hind and inner margins, brownish black. Under side: Ground colour brown, with a green suffusion over the upper half of the wing, a submarginal border of brown spots along the hind margin, and two distinct brown spots in the discoidal cell, the white apical band nearly obsolete; the costa at the extreme base bluish white. Hind wing similar in colour to the fore wing, two brown spots in the cell, a whitish spot near the costa, situated near the centre of the wing, followed by a faint white line, but only as far as the first subcostal nervule. Expanse, 2·7 in.

♀. Similar in colour to the male, the metallic blue on both wings somewhat brighter in colour. On the fore wing the white apical band broader and more strongly marked, a white spot at the extreme apex of the wing. Under side exactly similar to that of the male, the brown transverse band on the fore wing more strongly indicated than in the male. Expanse, 3·3 in.

This species is allied to the *E. sophus*, Fabr., and *E. aurora*, Auriv., group, but is distinguished from both by its beautiful blue colour. The sexes are alike, which is not usually the case in this genus.

Euphaedra cottoni, sp. n.

Fore wing black, with a large patch of metallic blue on the inner margin, extending to the base and along the costal margin. A transverse band of yellow spots crosses the apical area; these spots are situated between the nervules. Hind wing entirely metallic blue, the costal, hind, and inner margins black, the hind margin having a submarginal row of blue spots. Under side: Ground colour somewhat greener than in *E. rezia*, the costa yellow, the apex of the fore wing white, the black submarginal spots not so strongly marked. Hind wing green, suffused with yellow on the inner margin, the black spots and

1. - The hind crossing the discal area
1. - *E. rufa*, but differs from that
1. - and on the fore wing. It
1. - as the genus varies tre-
1. - in the Ituri Forest, Congo
1. - Beni, elevation between
1. - in the year 1905, and

WELLING DURING 1906.

WHITTINGHAM.

— 575 — 130.)

was in good measure to the kind of Oliver, was very enjoyable, and in splendid condition. It was secured, together with *Melanargia galatea*, and *cardamines* and *Thecla rubra*, taken on July 4th, and a day or two generally observed. *Thecla rubra* breed, or only a continuation of *Euchloë cardamines*? Cornish County in which one would expect *Vanessa cardui* were about as plentiful among the thrift, and were in the hot sunshine. Amongst the grasses, and *Agrotis lunigera* and *A. subfuscata*, and heath-flowers. Sugar plants as *Apamea gemina*, *Miana striata*, and *Alciphia subsericeata* was in some numbers. Butterflies were also netted:—*Bapta alchemillata*, *Eupithecia jasioneata*, and *Anticlea rubidata*. Scattered along the sea-front, and *Botys terrealis*, *Nemophila noctuella*, and *Crambus*. Only three "plumes" were observed this. (*Edematophorus lithodactylus*,

striana, *Bactra lanceolana*, *Conchyliis straminea*, *Spilonota roborana*, *Catoptria cana*, *Eupœcilia angustana*, *Chrosis alella*, *Sciaphila subjectana*, and *Argyrolepia cnicana*. *Eupœcilia hybridella* occurred, and among *Tineæ*, *Lita marmorea* (very varied), and two specimens of *Lampronia prælatella*. Close searching at various times of the day and evening failed to reveal any more than these two.

The larvæ of *Eupithecia venosata* were plentiful among *Silene maritima*, and a few *Polia xanthomista* were discovered, which duly produced moths at the end of August.

On Monday, July 30th, I commenced a holiday, not altogether of an entomological character, at Ullswater, and bethought myself that by an early start I might secure something on the way. Accordingly I bicycled over to Rugby late on Sunday evening, and caught a night train to Carnforth, which enabled me to get a wash and some breakfast, and be at Arnside-Knott as early as butterflies were likely to be on the wing. After some search I succeeded in taking a couple of examples of *Erebia blandina*, evidently freshly emerged. Soon after the sky became overcast, and the rumbling of distant thunder made it evident that my chance of getting any more was at an end for that day; so, leaving the Knott, I presently found a train to take me across the estuary to Grange, and had a few hours on the moss at Witherslack; while the constant thunder from the storm-clouds over the Knott told me I had done wisely to come away. By three o'clock I had to leave, and had a delightful ride by the side of Windermere and over the Kirkstone Pass to Ullswater. I came back a week later for a second attempt to get a series of *blandina*, but again storm-clouds were covering the Knott, and made it hopeless, so that once more I confined my attention to the moss.

The storm, indeed, was not so kind as on the previous occasion, for hardly had I got well on to the moss when the storm broke, and both I and the moss were soaked. However, I stuck to it, with such shelter as the pines afforded, and by and by the sun came out, and presently insects were walked up. A few *Cœonympha typhon* were still on the wing on the earlier visit, though worn, and *Lycæna ægon* was also flying, the females presentable. *Nemeophila plantaginis* was in perfectly good condition, and so were a couple of *Anarta myrtilli*. *Selidosema ericetaria* was in some numbers, the males mostly worn, but I only turned up four specimens of *Carsia imbutata*. I secured eggs from *ericetaria*, but I cannot say I am very sanguine as to the larvæ having got through the winter alive. *Hyria muricata*, *Crambus margariellus*, and *Retinia buoliana* were netted, and a fair series of *Amphisa gerningana*. *Mixodia schulziana* was abundant, and in resplendent condition. On my way back to Ullswater I found two larvæ of *Cucullia asteris* on *Solidago* in a wood, and should

... time had permitted a good

Larentia cesiata swarmed and *L. lirata* was plentiful. The last-named species; they were difficult to know what to do with. A partial second brood of a mountain form of *L. didyma* and *L. sobrinata* was plentiful. Some interesting forms were taken. One and one or two examples were boxed half-way up. *Hypsipetes sordidata* were males of *populata* were all discoloured, seen elsewhere, and were all normal in size, but larger than our Midland form; the basal area or the whole wing was altogether brown, almost grey obliterated. *Sordidata* was in and fuscous forms. *Cidaria* was in colour, a dusky brownish grey. The usual reddish grey, the violet instead of ochreous. I sat on the heather by searching for butterflies; nor was sugaring productive. *N. pronuba*, *N. xanthographa*, the last the dark variety was as

were rather disappointing, & pleasant enough. The August came to sugar on the sand-hills, *litterosa*. That was all. A was found newly emerged on a sand-hills on August 21st, and I was which was kind enough to have just hatched. I have and now feeding progeny of a took at rest. The record of *phleas*, some of them with completes my notes of this

CURRENT NOTES.

By G. W. KIRKALDY.

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116. "Proceedings of the Eighteenth Annual Meeting of the Association of Economic Entomologists." *Op. cit.*, 60; 1-206, figs. 1-10, plates i.-iii. (September 22nd, 1906).
117. DIMMOCK, G. W.: "Algunas Coccinellidæ de Cuba." *Inform. Estac. Centr. Agron. Cuba* i., 287-392, plates 50-2 (June 1st, 1906). [Coleoptera].
118. COOK, M. T.: "Informe del Departamento de patología vegetal." *Op. cit.*, 147-208, plates 24-9.
119. *Id.*: "Algunas Agallas de Cuba producidas por Insectos." *Op. cit.*, 247-52, plates 47-9. [Diptera].
120. DESNEUX, J.: "Termitidæ o comejenes. Habitos e historia de su vida." *Op. cit.*, 393-407, figs. 1-10, plate 53. [Neuroptera].
121. THEOBALD, F. V.: "Some Notable Instances of the Distribution of Injurious Insects by Artificial Means." *Science Progress* i., 58-72, figs. 1-3 (July, 1906).

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123. KNAB, F.: "The Swarming of *Culex pipiens*." *Psyche* xiii., 123-33 (October, 1906). [Diptera].
124. SLOANE, T. G.: "Revision of the Cicindelidæ of Australia." *Proc. Linn. Soc. New South Wales* xxxi., 309-60, plates 25-31 (October 3rd, 1906). [Coleoptera].
125. HARRISON, L. W. H.: "Variations of *Lycaena astrarche* in Britain." *Bull. Soc. Lép. Genève* i., 30-2 (1905). [Lepidoptera].
126. FERNALD, H. T.: "The Digger Wasps of North America and the West Indies belonging to the Subfamily Chlorioninæ." *P. U. S. Mus.* xxxi., 291-423, plates vi.-x. (No. 1487) (1906).
127. CARY, M.: "On the Diurnal Lepidoptera of the Athabaska and Mackenzie Region, British America." *Op cit.*, 425-57 (No. 1488) (1906).
128. CROMBRUGGHE DE PICQUENDAELE, Baron de: "Larves de Microlépidoptères vivant en août, sur les trembles de la forêt de Soignes." *A. S. E. Belg.* 50, pp. 271-2 (October 4th, 1906).
129. GROSVENOR, G. H.: "Cuba—the Pearl of the Antilles." *Nat. (U.S.) Geogr. Mag.* xvii., 535-68 (including 24 full-page illustrations), 1 map (12 x 24 ins.) (October, 1906).
130. MUIR, F.: "Notes on some Fijian Insects." *Bull. Hawaiian Sugar Plant. Ent.* 2, pp. 1-11, plate i. (November 10th, 1906). [Coleoptera, Diptera, Hemiptera, Hymenoptera].

The "Life Story of the White Admiral Butterfly" (106) will doubtless be interesting to many readers of the 'Entomologist.' The reference is to the American edition of the magazine, which may not be the same as the British.

Craw and Kotinsky's Report (107) deals with a record of the quarantine work of 1905, and of the breeding and dissemination of beneficial insects during the same period. There are also reports on visits to the various islands of the Hawaiian Archipelago. The reports on Lantana Insects and Hornfly are reprinted from the Rep. Hawaiian Livestock Association.

It is interesting to compare the Cicadid and Cercopid faunas of Japan with the similar British ones. In the British Isles there are one Cicadid and seven Cercopids, in Japan sixteen Cicadidæ and forty Cercopids already described (108-110). The naturalists of Sapporo, in Japan, have started a Natural History Society, and published part of the first volume of their 'Transactions.' Matsumura records fifty-six species of Hemiptera from the Riu Kiu (Loochoo) Islands, of which ten are new (111).

Hopkins and Webb (112-113) discuss the life histories of the Cerambycid *Cyllene robiniae* and the Scolytid *Dendroctonus brevi-*

cornis respectively, while Hine (115) deals at length in the same way with five species of *Tabanus* and a *Chrysops*. These papers cannot be neglected by British field-workers.

Hinds (114) discusses proliferation in the Cotton Plant—that is to say, “the development of numerous elementary cells from parts of the bud, or boll, which are themselves normally the ultimate product of combinations of much more highly specialized cells. The resulting product is thus composed of comparatively large, thin-walled cells, which are placed so loosely together that the resulting formation is of a soft texture, and has a granular appearance,” plainly to be seen with the naked eye. This proliferation has been ascertained to be the cause of a higher rate of mortality in the terribly destructive boll weevil (*Anthonomus grandis*), death resulting generally mechanically from simple pressure, for the proliferous tissue is not toxic to the weevils.

The Proceedings of the Association of Economic Entomologists (116) are, as usual, of great biological interest. Among the more interesting papers are the following:—(a) “The Scope and Status of Economic Entomology,” by H. Garman (5-24); (b) “The Corn Root-Aphis and its attendant Ant,” by S. A. Forbes (29-41) [Hemiptera, Hymenoptera]; (c) “Observations upon the Migrating, Feeding, and Nesting Habits of the Fall Webworm (*Hyphantria cunea*, Dru.),” by E. W. Berger (41-51, plate i.) [Lepidoptera]; (d) “The Care of Entomological Types,” by T. D. A. Cockerell (51-2); (e) “Notes upon a Little-known Insect Enemy of Cotton and Corn (*Cicada erratica*),” by W. Newell (52-8, figs. 1-2) [Hemiptera]; (f) “History of Economic Entomology in Hawaii,” by J. Kotinsky (58-66); (g) “The Relation of Descriptions to Economical Methods of Eradication in the Family Aphididæ,” by C. E. Sanborn (162-6) [Hemiptera]; (h) The Currant Root-Aphis (*Schizoneura fodiens*, Buckton) [in England], by F. V. Theobald (166-70, figs. 7-9) [Hemiptera]. It should be noted that the “Report of Committee on Nomenclature” (25-8) is on the nomenclature of popular names only.

Dimmock has produced an extensive paper, chiefly biological, on Cuban Ladybirds (117), while Desneux (120) discusses some Termites from the same island. Cook deals (118) with various insect pests, and (119) Dipterous galls, also from Cuba.

Nörgaard (122) discusses the Screwworm Fly (*Compsomyia macellaria*) and the Hornfly (*Hæmatobia serrata*).

Sloane (124) revises the Australian Cicindelids; the introductory remarks (309-17) and various notes in the course of the paper are of general interest.

According to the ‘Journal of the Royal Microscopical Society,’ Harrison discusses the British *Lycæna astrarche* and its var. *artaxerxes* (125).

Fernald (126) has monographed the North American and Antillean Chlorioninæ—that is to say, the group formerly known as Sphecinæ, the latter name being now applied to the old Ammophilinæ. The external anatomy is discussed, followed by analytical keys and descriptions of the genus *Chlorion*, its subgenera and species.

Among the Rhopalocera enumerated from Northern Canada are *Euvanessa antiopa*, *Vanessa atalanta* and *cardui*, *Anosia plexippus*, and varieties of *Papilio machaon*, *Pontia napi*, and *Cœonympha tiphon* (127). The Baron de Picquendaele (128) briefly remarks on the larvæ of several Micro-Lepidoptera found in Belgium on the aspen.

An up-to-date map of Cuba (129) has just been published.

Muir (130) gives a brief account of a visit to the Viti Isles in search of parasites, followed by anatomical and bionomical notes on Stylopidae, with description of a new species of Pipunculidae.

ERRATA.—P. 85, line 6, for "reduction" read "redaction"; line 16 from bottom, for "Ranatia" read "Ranatra"; p. 86, line 7, for "Ageomyzid" read "Agromyzid."

TORTRIX PRONUBANA, Hb., DOUBLE-BROODED IN BRITAIN.

By ROBERT ADKIN, F.E.S.

FROM what I saw of the earlier stages of *Tortrix pronubana* last autumn, I was so convinced that an earlier emergence would be found to take place that I determined to investigate the matter at the earliest opportunity. This occurred at Whitsuntide, when I was able to spend a few days at Eastbourne. A diligent search of the *Euonymus* hedges produced a number of *Tortrix* larvæ, the bulk of them only too evidently not of the species sought; but among them were two or three suspiciously like those found last autumn, and a pupa that was met with also looked likely in general appearance, but instead of being between two leaves, as was invariably the case with the autumn pupæ, it was enclosed in a single rolled leaf. However, the emergence from this pupa of a fine male, and one example of each sex of the species having resulted from the miscellaneous collection of larvæ, has shown clearly that there are at least two generations of *Tortrix pronubana* in the course of the year in Britain.

Lewisham: June, 1907.

NOTES AND OBSERVATIONS.

NEUROPTERA.—Dr. Chapman was kind enough to hand to me the following insects recently taken by him in France:—One male of the dragonfly, *Sympycna fusca*, Vanderl., taken at Hyères, March 24th to April 9th, 1907; two *Holocentropus stagnalis*, Albarda (Trichoptera), which occurs locally in England, taken at the same date and place; one *Mesophylax aspersus*, Ramb. (Trichopteron), a southern insect (once taken in England, but probably a "casual"), captured at Ste. Maxime, April 10th to 28th, 1907; one *Micropterna fissa*, McL. (Trichopteron), another southern insect, taken at the same date and locality as the last.—W. J. LUCAS.

LEAF-INSECTS IN CAPTIVITY.—Mr. St. Quintin's note on the above subject in the April number of this Journal is of great interest. The discovery that these insects can be reared upon beech, oak, and ilex leaves will enable many people in England to have the pleasure of watching the transformations of these most remarkable of tropical insects. The damp atmosphere is a *sine qua non*, both in the hatching of the eggs and the successful raising of the young insects. But I am writing more particularly to correct an error in the name of the species said to have been obtained by Mons. Morton from Ceylon. *Phyllium (Pulchriphyllum) scythe* is recorded only from Northern India, and is not known to occur in this island. Our commoner Ceylon species is *curifolium*, and it is probable that this species is the subject of Mons. Morton's paper. It has a range extending through Ceylon, Borneo, and the Seychelles.—E. ERNEST GREEN; Government Entomologist, Royal Botanic Gardens, Peradeniya, Ceylon, April 22nd, 1907.

BARRETT'S 'LEPIDOPTERA OF THE BRITISH ISLANDS' AND ITS INDICES.—Having agitated for the publication of a Specific Index to Barrett's 'Lepidoptera,' it is only right that I should express our indebtedness to the publishers of that work for having taken the hint, and this I do with much pleasure. I now have a copy of this index before me, and, although its method is not all that could be desired, it will answer a useful purpose, and enable easy reference to a desired species without the necessity of hunting through many pages of closely printed matter to discover where the required information may be found, as was the case before its publication. Such references as *Fuligana*, vol. 10, p. 379; *Fuligana*, vol. 11, p. 63; *Marginata*, vol. 6, p. 146; *Marginata*, vol. 7, p. 274; *Rufana*, vol. 10, p. 235; *Rufana*, vol. 11, p. 29, and so forth, of which there are several, are worrying, and it is to be regretted that in cases where the same name is used for more than one species some indication of the generic name also is not given; indeed, it is surprising that with such examples of complete indices as that of Staudinger's 'Catalogue,' 1901, or even the special indices of some of our current periodicals, such omissions should have occurred. It is also to be regretted that the size of the paper on which the index for the large-paper edition is printed is not of the same size as that of the body of the work. These, however, are but trivial defects, and the index will, without doubt, be found exceedingly useful by all those who desire to use the work as a book of reference, and I doubt not that they

(Ms. B. 1. 1. v. 1. p. 109) sought
the author of the deceased author?
What words of reverence to his
memory does his life's work? Had
he not given one-tenth of the labour
of his life to his useless "List of Plates"
and his equally useless "List of Species
of the British Islands"; the pages
of which we can well afford to "bury
in oblivion". June, 1907.

At Eastbourne in the early days
of the patch growing in a sheltered
valley, indicated by the nearly full-fed
streams, must have been some thousands
of caterpillars, of which they had hibernated were
fully worked the district pretty
well. I have not previously met with
such a larger colony in the surrounding
districts. The fact of this isolated
corner of our island appears to
the possibility of the parent moths being
of the species being "in considerable
numbers" in the South of France last year (Proc.
Linn. Soc.). It may perhaps also give a clue to
Lewisham, June, 1907.

FIELD REPORTS.

—Last year I gave over some of my
time to collecting, with much success as far as rarities go, yet
I am fully persuaded to continue
the same occupation. The best collecting-grounds were Braunton Bur-
row (the cliffs) and the valley of the Yeo, at
Barnstaple. It is necessary for me to point out the riches
of the Yeo valley (which I said were) accustomed to find on
the moors. The Yeo valley has an exceptionally low rainfall,
and is probably the hottest part of North
Devon. The Yeo valley is well wooded, but with
few large trees. The banks of the river are profuse
in ferns, and the smaller members of the Geode-
mataceae in thousands. There are very few
water-beetles in the north of the county, and
fewer in the Yeo valley. Rocky moor-
lands are numerous. The following list, which is by
no means complete, gives an idea of the time I devoted to collecting,
and most notable forms I came across.
I consider the Barnstaple district to be

very poor in Coleoptera. Some of the species were taken by my friend Mr. H. H. Hamling, and in those cases I have inserted his name in brackets after the record :—

Cicendela campestris. Common in the Yeo valley.—*Carabus violaceus*. The commonest of the genus.—*C. arvensis*. One specimen on Codden Hill.—*Cychrus rostratus*. In South Devon, near Totnes, I took two under stones, on the border of a larch-wood.—*Leistus ferrugineus*. Frequent under stones and bark.—*L. spinibarbis* and *L. fulvibarbis*. One of each, under stones.—*Nebria complanata*. This is a common insect on the sandy shores of the coast, at Greysands and Santon (under sandstone boulders at the foot of the cliffs) and Woolacombe. Their colouring makes them hard to see on the sand until they move, but they generally remain still in times of danger.—*Broscus cephalotes*. Common in the same localities as last.—*Dyschirius globosus* and *D. impunctipennis*. The Burrows.—*Chlaenius vestitus*. Common at Venn Quarry, Barnstaple; one specimen on the Yeo and a few at Bishopstowton.—*Badister bipustulatus*, *Dromius linearis*, *D. nigriventris*.—*Pristonychus terricola*. Plentiful on the beech at Santon, at the foot of cliffs, and in the dark caverns.—*Anchomenus angusticollis*. Reported as rare here, but it is common in Acland Woods under bark, and at one or two other Barnstaple localities.—*A. fuliginosus*. Under alder bark.—*A. marginatus*. Braunton Burrows; not common; and *A. thoreyi*, Dej.—*Calathus melanocephalus*. Common.—*Dichirotrichus pubescens* and *D. obsoletus* and *Cillenus lateralis*. River Taw.—*Bembidium obtusum*, *B. rufescens*.—*B. pallidipenne*. Plentiful under stones and bits of bark near water, Braunton Burrows.—*Dytiscus marginalis*. Venn Quarry (H. H. Hamling).—*Agabus nebulosus*. Has been taken on Lundy Island; also at Venn.—*Deronectes 12-pustulatus* and *Colymbetes fuscus*.—*Orechtochilus villosus*. Under stones on the edge of the Yeo river, taken in daylight.—*Creophilus maxillosus*. Very common; also *Bledius arenarius*.—*Staphylinus caesareus* and *Philonthus marginatus*.—*Olophrum piceum*. Yeo valley.—*Megacronus cingulatus*, Mann. One specimen, Acland Woods.—*Ocypus ater*. Common at Santon.—*Atemeles emarginatus*. In large numbers in nest of *Formica rufa* in South Devon, near Totnes.—*Tychus niger*. Common.—*Pyrochroa rubens*. Common on timber.—*Siipha thoracia*. Two in fungus, Acland Woods; and numbers near West Buckland by roadside (H. H. Hamling).—*Atomaria linearis*. About 4½ acres of mangolds were destroyed by these little beetles some time ago. The Board of Agriculture advises that a Strawsoniser be run over the field with ordinary Paris-green wash, and considered deep ploughing advisable. In districts on the Continent where this beetle is a serious pest to sugar-beet, "thick sowing of seed" is practised, and would be worth doing in this country, where the species is over numerous.—*Tritoma bipustulata*. Tawstock Woods.—*Coccinella 14-guttata*. On alders.—*C. variabilis*.—*Sinodendron cylindricum*. One in rotten beech; and also at Lynton (H. H. Hamling).—*Dorcus parallelopodus*. Near the moor in Somerset, but on the Devon border (H. H. Hamling).—*Geotrupes typhaeus*. One specimen, Santon; also a pronotum of female among some remains left by bats, Braunton.—*Heterocercus lavigata*. River Taw.—*Phyllopertha vulgaris* and *Cetonia aurata*. Barnstaple.—*Anomala aenea*. Common at Santon.—*Hoplia philanthus*,

On *Heracleum*.—*Melanotes rufipes*. Two under bark at Venn.—*Lamprinus noctiluca*. Very common.—*Niptus hololeucus*. Numerous in old cupboards.—*Cleonus sulcirostris* (H. H. Hamling). One at Santon.—*Cionus blattariae*, *Strophosomus coryli*, and *Apoderus coryli*, the latter at Acland Woods.—*Apion miniatum*, Common.—*Cænopsis waltoni*. Common in moss: woods.—*Otiorhynchus atroapterus*. Santon.—*Rhagium inquisitor*. In rotten oak, Clovelly.—*Pachyta 8-maculata*. River Yeo (vide 'Entomologist,' November, 1906, p. 259).—*Cryptoccephalus lineola* (H. H. Hamling).—*Haltica verbasci*. Very common on the mullein.—*Cassida splendidula*. River Yeo, by beating; one specimen.—*Chrysomela banksii*. Common, especially in South Devon, near Totnes, at Harberton.—*C. hyperici*. Common; and *C. goettingensis*, at Harberton and Venn, Barnstaple; two only.—*Phytodecta olivacea* var. *litura*. On broom, River Yeo.—*Galeruca calmariensis*, *G. lineola*, *Adimonia capreae*.—*Calomius circumfusus*. On gorse, Codden Hill.—*Typhaea fumata*. Under bark.—*Helops pallidus*. One at Braunton Burrows.—*H. striatus*. Very common under bark.—*Cistela sulphurea*. Common on low plants, Braunton.—*C. murina*. On coast.—*Phaleria cadaverina*. Common under stones and seaweed on the shore.—*Opatrium sabulosum*. Common, Braunton Burrows; also *Helopathes gibbus*. On sandhills, crawling over loose sand.—*Melandrya caraboides*, On stinging-nettles; one specimen at Venn.—BRUCE F. CUMMINGS; 14, Cross Street, Barnstaple.

LARVÆ IN 1907.—In view of the remarks made by Messrs. Newman and Huggins concerning the scarcity of *Arctia caia* larvæ this season, I should like to give my experience of the Norfolk Broad district. In spite of heavy rains I collected over one hundred in six days, in marshes over which I had hunted the two previous years, and found only a dozen or so. This was in the first week of June each year. There was a great increase in the number of *Odontestis potatoria* too, and I should be very glad of an explanation of this really remarkable abundance. Is it due to the fact that in this swampy district last summer's extreme drought was favourable to autumn-feeding larvæ? G. BROOKS; Ivyside, North Finchley, June 16th, 1907.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, June 5th, 1907.—Mr. C. O. Waterhouse, President, in the chair.—Mr. C. N. Hughes, of Knightstone, Cobham; Mr. Albert Ernest McClure Kelly, Assistant Entomologist to the Department of Agriculture, Natal; and Mr. M. G. Muklie, of Hyderabad, Sind, India, and Cambridge University, were elected Fellows of the Society.—The decease was announced of Dr. Frederic Moore, D.Sc., A.L.S., F.Z.S., the "father" of Indian entomology, and one of the oldest Fellows of the Society; and of Mr. C. J. Watkins.—The President read a communication from the Rev. F. D. Morice, M.A., the Society's delegate to the celebrations in honour of the Linnaean bicentenary celebrations at Upsala and Stockholm, announcing the delivery of the addresses and the hospitality with which he had been received at both places. It was resolved to

publish the addresses in the Society's 'Proceedings.'—The President read a letter received from Dr. Karl Jordan, F.E.S., asking the support of the Society for an International Congress of Entomology. A resolution, cordially approving the Congress, and offering the support and co-operation of the Society, was carried unanimously.—Dr. T. A. Chapman exhibited a living example of *Leioptilus carphodactylus*, Hb., one of the first bred British specimens which had emerged on June 2nd, from larvæ found by Mr. J. Ovenden.—Mr. H. St. J. Donisthorpe showed a specimen of *Microdon mutabilis*, with the empty pupa-case, bred from a larva taken in the nest of *Formica fusca* at Portlock, April, 1907; also males and females of *Kleditoma myrmecophila*, n. sp., bred last month from a nest of *Lasius fuliginosus* found at Wellington College in March, 1907. He said that this species of parasitic Cynipidæ, which was new to science, had been named by Professor Dr. J. J. Kieffer.—Mr. M. Jacoby brought for exhibition examples of small beetles, new to science, of the new genus *Clythridæ*, including *Leasia australis*, Jac.—Mr. A. J. Chitty exhibited the three types of the three species of *Proctotrupidæ* (*Gonatopus*), described by Westwood but entirely overlooked by subsequent authors.—Mr. E. E. Austen, F.Z.S., exhibited larvæ, pupæ, and imagines of *Cordylobia anthropophaga*, Grunb., a Muscid fly which is widely distributed in tropical and subtropical Africa, from Senegal to Natal, and in the larval stage is a subcutaneous parasite in man and certain other animals. Larvæ of various Muscidæ have frequently been found parasitic in human beings, but the parasitism is usually accidental; the larvæ of *C. anthropophaga*, however, like those of the *Estridæ* (Bot and Warble flies) appear to be normally parasitic. Much confusion as to the identity of this Muscid has been caused by its having been wrongly referred to by certain writers as *Bengalia depressa*, Walk., a totally different insect, which there is no reason to believe to be a parasite.—Professor E. B. Poulton, F.R.S., read a note "On the Significance of some Secondary Sexual Characters in Butterflies."—Dr. F. A. Dixey, M.A., M.D., and Dr. G. B. Longstaff, M.D., contributed a report of their joint entomological observations made in South Africa during the visit of the British Association in 1905, and gave a brief account of some of the points dealt with.—H. ROWLAND-BROWN,
Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—
May 9th, 1907.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Goulton exhibited a long bred series of *Hybernia marginaria* (*progemmaria*) from Wimbledon.—Mr. Newman, a brood of living larvæ of *Aporia crataegi*, from Kentish ova; they were nearly full-fed.—Mr. Kaye, living larvæ of *Oporina croceago*, from Gomshall.—Mr. Tonge, bred specimens of *Eupithecia consignata*, from Hayling Island.—Mr. Main, lantern-slides, showing the metamorphoses of *Charaxes jasius*.—Mr. Tonge, lantern-slides, showing the ova of various Lepidoptera and numerous instances of protective coloration.—Mr. Lucas, lantern-slides, showing rare plants.—Mr. Dennis, lantern-slides, showing varied aspects of trees.—*Hy. J. TURNER, Hon. Rep. Sec.*

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society, 1906-7. Pp. i-xvi, 1-106. Plates i.-iv. The Societies' Rooms, Hibernia Chambers, London Bridge.

The entomological papers in this excellent little publication, the issue of which is always awaited with considerable interest, are "A Few Notes on the Butterflies of Saskatchewan (Assiniboia)," by A. G. Croker and H. J. Turner, F.E.S., and "On the Occurrence of *Tortrix pronubana*, Hb., in Britain," by R. Adkin, F.E.S. Two of the plates are reproductions of photographs, by Messrs. G. T. Lyle and E. Step, of moths at rest on tree-trunks. The protective assimilation is admirable in both, but in Plate i., showing an example of *Xylina ornithopus*, the insect is, at first, more difficult to detect than is *Aplecta nebulosa* on Plate ii. Plate iii. shows a specimen of *Eupithecia consignata* at rest, and eggs—highly magnified—of the same species. These, together with greatly enlarged eggs of *Aporia crataegi* and *Pachetra leucophaea*, on Plate iv., are from photographs by Mr. A. E. Tonge.

In his address, the President, Mr. Robert Adkin, after dealing with the affairs of the Society, some books on Natural History published during the year, and recent additions to the British Fauna lists, concludes with some highly interesting remarks on the abundance of certain species of Lepidoptera in Britain during 1906, and the question of immigration in relation to such species and others.

OBITUARY.

WE have heard with regret that Mr. CHARLES J. WATKINS, of Watledge, Nailsworth, died May 27th, 1907, aged sixty years.

When quite young Mr. Watkins commenced to collect and study the British Lepidoptera, and this he continued to do throughout his life, although the other orders also received his attention. Side by side with entomology went the study of plant life, indispensable when a knowledge of the larval stage of insects became essential. Mr. Watkins thus was as keenly interested in the flora of the country as many botanists who confine themselves to this branch of natural science alone. Patient, methodical, and completely absorbed by the main business of his hours of leisure and relaxation, he accumulated a large collection of insects. He took great interest in directing youthful energy into what he considered profitable channels. In this way he formed a wide circle of friends, by no means confined to the immediate neighbourhood in which he lived. For many years he knew and worked with the late Mr. Merrin, of Gloucester. He gave valuable assistance in the preparation of 'The Fauna of Gloucestershire' by the late Mr. C. Witchell. Among articles from his pen may be mentioned "Denizens of an Old Cherry-tree." He was elected a Fellow of the Entomological Society of London in 1900.

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NOTES ON THE GENUS *EUPITHECIA*.

BY LOUIS B. PROUT, F.E.S.

I. BIBLIOGRAPHY AND SYNONYMY.

NOTWITHSTANDING the amount of good work that has been done at this fascinating genus, both by the past generation and the present, there is still room for much more, and especially there is need that what has been done should be more widely known. I do not pretend to have much to contribute which is original, but the notes—bibliographical, synonymic, and bionomic—which I have been accumulating for years have at least put me in a position to call the attention of those who will read the following to various English references which have been overlooked by German workers, and *vice versa*.

To begin at the beginning. The generic name, *Eupithecia*, Curt., is *not* to be supplanted by *Tephroclystis*, Hb., as has been done by Meyrick and Staudinger-Rebel. Curtis published the genus *Eupithecia* (with type *linariata*, Schiff., Fb.) on April 1st, 1825; *Tephroclystis*, Hb. ('Verzeichniss,' p. 323) is now known not to have been published before August 27th of that year, more probably (as Hampson, Meyrick, and Aurivillius now accept, Proc. Int. Congress Zool., Cambridge, 1898, App. A., pp. 300, 302) not till 1827, or at earliest 1826. I advocated this retention of the name *Eupithecia* in the Trans. City Lond. Ent. Soc. x. 68, 1901, and the late Prof. Grote did so on somewhat different grounds* in the Allg. Zeit. Ent. vii. 470, in the following year.

Eucymatoge, Hb. (Verz. p. 325, type *togata*, Hb.), may provisionally be used, as advocated by Meyrick and others, for the few species with the areole double, but I have serious misgivings as to its proving a really natural genus, especially as there

* Grote assumes the date of both to be 1825, and the actual priority to be undeterminable, and therefore follows the recommendation of the German Zoological Society's Code in preferring the name which had a type specified.

is evidence that this character is variable in certain "pugs" (*cf.* Dietze and Bastelberger, 'Iris,' xiv. 140-1); in any case, the dissonant element incorporated by Meyrick (*tersata*, *vitalbata*, and allies) must be removed on larval and other characters, and form part of the genus *Cœnocalpe* = *Phibalapteryx*. The British "pugs" which belong to *Eucymatoge*, according to Meyrick, are *togata*, *subnotata*, and *scabiosata*, and it needs a little faith to unite these, while isolating them from the rest, on larval characters; perhaps *togata* alone would make a better genus.

Chloroclystis, Hb. (Verz. p. 323, type *coronata*, Hb.) seems a valid genus, is accepted by Staudinger, and ought to be used in Britain for our three green species. The same remarks apply to *Gymnoscelis*, Mab., for *pumilata*, except that this has not been accepted by Staudinger. It is interesting to observe that Mr. F. N. Pierce, of Liverpool, who is examining the genitalia of the group, considers the harpes of *Gymnoscelis pumilata* to constitute it a group by itself, and also places *Chloroclystis* as separate from the main groups.

As regards the synonymy of the species, some corrections which have been made by Dietze, Bohatsch, and others on the Continent, and accepted in Staudinger's new edition, have not yet been introduced into any authoritative British list; whilst certain other necessary corrections have been made still more recently, or will be here made public for the first time. In this connection I shall include also several bibliographical emendations which have escaped the notice of our German *confrères*, especially concerning our early British work at the genus. We English have been the worst of bibliographers, and I am really not surprised that at least four species, perhaps more, have not their original description cited in Staudinger's 'Catalog,' while some varietal names have been entirely overlooked. I shall not separate the British references from the non-British, but shall take the species in the sequence in which they occur in Staudinger.

Eupithecia ræderaria, Stndf. (1888).—Dietze has discovered that an older name applies here, namely, *liguriata*, Mill. (1884)—cited with a query as synonym of *distinctaria*, H.-S., Stgr.-Rebel, pt. ii. p. 256.

Eupithecia abietaria, Goeze.—Dietze has shown ('Iris,' xiv. 139) that this name really applies to *togata*, Hb., not to *strobilata*, Hb., ?Bkh., to which it has long been referred. German entomologists are now using *abietaria* in the corrected sense, but fortunately the familiar name of *togata* really stands unimpaired. *Phæna Geometra abietaria*, Goeze, 1781, was a homonym, invalidated by *Geometra abietaria*, Schiff., 1776 (= *ribeata*, Cl.), and the first valid name imposed was Hübner's.

Eupithecia insigniata, Hb.—Hübner's name (Beitr. ii. pt. iv. p. 97) is at least two years older than Borkhausen's *consignata*,

which is still used in Britain. Sherborn's 'Index Animalium' gives the date of *insigniata* as 1790, according to the title-page of vol. ii., but Staudinger is more likely right in giving 1792. Vol. i. of the 'Beiträge,' in four parts, was published in 1786, 87, 88, 89, and it is unlikely that vol. ii., also in four parts, was completed in a single year, although its preface (dated 24th November, 1790) expresses a hope that this may be possible.

Eupithecia venosata, Fb.—I have already pointed out (Entom. xxxvii. 152) that the correct varietal names of the Shetland and Orkney forms are respectively var. *fumosæ*, Gregs. (= *nubilata*, Bhtsch.), and var. *ochracæ*, Gregs. (= *orcadensis*, Prout), and I have nothing further to add on these. I shall be grateful if any reader of these notes can furnish me with the original reference for var. *fumosæ*, as the earliest which I have obtained ('Young Naturalist,' viii. 111) does not give the impression of an original description, but at the same time I have sought in vain for an older one in the pages of the 'Young Naturalist.' Gregson also gave the name of var. *bandanae* ('Young Naturalist,' viii. 111) to the more variegated banded Shetland forms, with the white striæ well marked, and the ground colour darkened between them. The "var. *schiefereri*, Bhtsch.," of Staudinger's 'Catalog,' is, according to Bohatsch and Dietze, a valid species; *cæruleata*, Favre (Fn. Valais, p. 305), is a synonym (vide Mitt. Schweiz. Ent. Ges. x. 361).

Eupithecia distinctaria, H.-S.—British entomologists have continued erroneously to call this species by its younger name of *constrictata*, Gn. The latter name first appears in a note by Doubleday in 'The Zoologist' for 1856, pp. 5140, 5141, but as no description was given it must be reckoned a *nomen nudum* until Guenée's work appeared in January to February, 1858 (not in 1857, as is invariably quoted from the title-pages).

Eupithecia expallidata, Dbld., and *E. assimilata*, Dbld.—These are usually attributed to Guenée (1858), but both were named and adequately described by Doubleday in 1856 (vide Zool. xiv. pp. 5140 and 5142).

Eupithecia goossensiata, Mab., = *minutata*, Dbld., Gn., nec Hb.—The reference to Guenée in Staudinger's 'Catalog' should be preceded by "Dbld., Zool. 1856, p. 5140," but the name *minutata*, Schiff., properly belongs to *absinthiata*, and its later reference to the heath-feeding species is an error. If the name *callunæ*, Speyer (1867), is really referable to the same form, this is older than *goossensiata*, Mab. (1869), but there is still some doubt (vide Ent. Rec. xiii. 324).

Eupithecia denotata, Hb.—It is now perfectly well known that this name, unfortunately, supersedes the suitable one of *campanulata*, H.-S. There is some ground, however, for believing that it is not quite so absolutely confined to *Campanula* as we have been inclined to suppose. I shall return to this presently.

Eupithecia vulgata, Haw.—There seems very little doubt that Hübner's figure of *austerata* is really meant for this species, and that his name ought to supplant Haworth's.

Eupithecia virgaureata, Dbld.—The original reference to this name has been quite lost sight of, and it is generally stated to originate in Newman's 'British Moths.' But it was validly published several years earlier, namely, in 'The Zoologist' for 1861, p. 7566. This is fortunate, as it will just save the familiar and appropriate name. It will be noticed that *altenaria*, Stgr., also dates ostensibly from 1861,* and is given as a var. of *virgaureata* in Stgr. Cat. (one of several cases of "the cart before the horse," if his dates were correct). I am, however, by no means satisfied that *altenaria* is co-specific with *virgaureata*, and regard the question as an open one.

Eupithecia cauchiata, Dup. (not *cauchyata*, as spelt by Staudinger and Meyrick).—This species has never, to my knowledge, been taken in Britain; the name has crept into Meyrick's 'Handbook' through a misidentification of Guenée's *pernotata*. This latter, according to the type-specimens, Staudinger declares to be an obscurely marked *satyrata* (ab. *subatrata*, Stgr., which should hence be known as ab. *pernotata*, Gn.). In any case, Doubleday's unique British "*pernotata*" is, as Barrett correctly determined, an aberration of this variable species (*satyrata*, Hb.).

Eupithecia haworthiata, Dbld. (Zool. 1856, pp. 5139, 5141), Sttn. (Man.).—Here, again, the origin of the name has been overlooked, and it has been attributed to Stainton's 'Manual.' The name of *isogrammaria*, H.-S., rested on an error of determination, and must be dropped; *isogrammaria*, Tr., was *plumbeolata*, Haw.

Eupithecia tenuiata, Hb.—Gregson erected a var. *cineræ* from Morayshire ('Young Naturalist,' ix. 104, 1888), which might be diagnosed as "major, cinerascens, vix strigata."

Eupithecia inturbata, Hb. = *subciliata*, Dbld.—The name *subciliata* first appeared in Doubleday's 1856 article on the genus (Zool. xiv. pp. 5140, 5148), but even so it is far subsequent to *inturbata*, Hb., which has been rightly revived on the Continent (cf. Speyer in Stett. Ent. Zeit. xlvi. 473; xlvi. 94).

Eupithecia fraxinata, Crewe.—The original account of this was, I think, published almost simultaneously in two places—Week. Ent. i. p. 184 (6th December, 1862), and Ent. Annual (? December, 1862). The question is of little importance, as the same name is used in both.

Eupithecia dodoneata, Gn.—This name was mentioned by Doubleday in 'The Zoologist' for 1856, before Guenée published it; but it was only a *nomen nudum*, therefore of no standing.

* The date of p. 7566 of 'The Zoologist' was about June, 1861; *altenaria* appears in the Stett. Ent. Zeit. for October-December, 1861 (p. 401), hence probably published at the beginning of 1862.

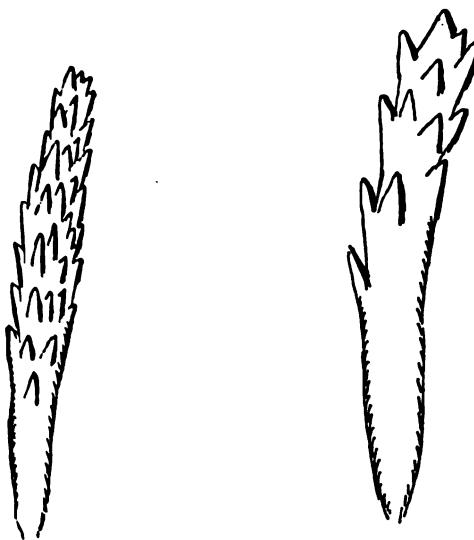
Eupithecia sobrinata, Hb.—The Dover var. (or bon. sp.?), which is usually spoken of as *stevensata*, Webb (a name never satisfactorily published), was named *anglicata* by Herrich-Schaeffer in 1863 (C. B. Zool.-min. Ver. Regensb. xvii. 23), and must so stand in future lists. The interesting occurrence of a perfect specimen at Freshwater (Entom. xxxviii. 161) seems conclusively to point to some other food-plant than juniper. According to Venables' 'Guide to the Isle of Wight' (p. 483), Brading Down, many miles from Freshwater, "boasts of the single shrub of juniper yet found in the Isle of Wight, and it, like the yew its neighbour, may have been planted."

II. SUCCENTURIATA, INNOTATA, AND ALLIES.

There are one or two other questions of the possible specific identity of pairs of allies which have not yet been adequately discussed; and, again, a few other perennial questions of the same kind, which it seems in vain to answer unless workers will take more pains than at present to acquaint themselves with the existent literature.

In this latter category I would place the *succenturiata-subfulvata* question, although I do not wish to be dogmatic, or to ignore the statement of Heylaerts (Tijd. Ent. xvi. 146) that he once took the two forms *in cop.* The subject has recently been reopened in this country by my friend Mr. E. M. Dadd (Ent. Rec. xviii. 261), who treats the species named as a "puzzling group" which still wants clearing up. He depends chiefly on the experience of Herr Herz, who on one occasion bred both species from larvae beaten from yarrow, and could not, or did not, sort out his larvae; also on the testimony of the eminent specialist, Herr Dietze, which, however, seems only to have reached him second-hand. Dietze published a fine plate of the various forms, with notes thereon, in the 'Iris' of 1906 (vol. xix. pl. iv. pp. 121-126), and treats all as making one variable species. In the text occurs this very definite statement: "That these are a single species is no longer mere conjecture, but has been demonstrated by anatomical investigation." He does not adduce the evidence, the article being mainly concerned with the variations figured, which are considered to show pretty complete gradations, though, to my eyes, the darkest *succenturiata* (ab. *disparata*, fig. 7), with the white persisting below the discal dot, is entirely different from the lightest forms of *subfulvata* (figs. 19 and 21), with at least a tinge of rust-colour in that position. I wrote to the author, pointing out that in Britain the two were abundantly distinct species, and had been differentiated as larvae and pupae, as well as imagines, and asking for further particulars of the biological evidence on which he relied. I received a very courteous reply, in which he informed me that Herr Petersen, of Reval, had found the male genitalia indistinguishable, and that his own long

experience of the larvæ had shown him no structural difference, while the coloration of *succenturiata* larvæ changed entirely when the food-plant was changed from *Artemisia* or *Tanacetum* to flowers of *Achillea*. He added that Dr. Draudt's careful work at the eggs (vide 'Iris,' xviii. 308) had also failed to educe any differential characters, although that author found more individual variation in both than in any other species of the genus. I may remark here that Mr. J. Gardner, of Hartlepool, admits that "in beaten larvæ I certainly would not undertake to say whether they were those of *E. succenturiata* or *E. subfulvata*," although his experience satisfies him that they are two species (Ent. Rec. xix. 24). Herr Dietze recognizes (in the letter just



SUCCENTURIATA.

SUBFULVATA.

referred to) a pupal difference, but remarks that a similar variation in the colour of the wing-cases occurs in *E. absinthiata*. As regards the genitalia, however, my old friend and colleague, Mr. F. N. Pierce, is entitled to have his say, as he is such an authority on this particular study. Although he freely admits that the differences are very slight, he is able to venture a fairly definite statement (*in litt.*, 29th January, 1907), as follows:— "I examined *subfulvata* and *succenturiata* many years ago, and only last night, now that I know the parts better, am I able to say definitely there is a difference. I enclose a rough sketch of the largest of the three teeth processes,* and am also sending for

* This sketch is reproduced in the accompanying cuts, by Mr. Pierce's permission.

you to see the preparations, from which I think you will see there is a difference in all three [processes], but most noticeable in the largest one." I forwarded the "rough sketch" to Herr Dietze, and he agrees that it shows a difference which, if constant, should be specific. I need not here refer to the work done by Crewe and Hellins nearly half a century ago (Zool. 1861, pp. 7796, 7797; Ent. Ann. 1861, p. 130; 1862, pp. 42-44; 1863, p. 126, &c.), except to recommend it to the notice of our Continental friends; for we in Britain have been, more or less, familiarized with it through Newman's, Buckler's, and other books. Much more recently (1895-96) a number of interesting notes appeared on the subject in vol. ii. of the 'Entomologist's Record' (pp. 43, 83, 87, 109, 197, 254), which brought out that, although the food-plants are not always different—mugwort, tansy, and yarrow suiting both species*—every other circumstance favours the absolute distinctness of the two. I would especially emphasize Mr. Sheldon's observations (pp. 197-198), including the pupal differentiation; the pupa of *subfulvata*, from an experience of thousands of examples, is shown to be rich red, with the wing-cases somewhat lighter and inclined towards buff; while that of *succenturiata* has the abdomen dark buff, inclined towards brown, and the wing-cases of a decided olive-green.

(To be continued.)

LIFE-HISTORY OF *CHYSOPHANUS DISPAR*
VAR. *RUTILUS*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

(Concluded from p. 146.)

BEFORE first moult the larva measures $\frac{1}{9}$ in. long, of a pale semi-transparent yellowish green. They continually shift their quarters, never remaining to feed in the same place long. The first moult took place on June 26th, the first stage lasting only five days.

Before second moult it is $\frac{3}{14}$ in. long. The whole formation is similar to the first stage; the segments are boldly humped dorsally, the sides flattened and sloping, the body being somewhat depressed; the dorsal surface forms a gentle curve from one end to the other, the ventral surface is flattened. The dorsal hairs, which are now more numerous, are much stouter and

* Readers who possess a copy of Barrett's 'British Lepidoptera' should make a small correction in vol. ix. p. 53. I did not tell Mr. Barrett that *E. subfulvata* fed willingly on the blossoms of the garden chrysanthemum, but on the leaves; *E. succenturiata* can also be reared on chrysanthemum-leaves.

shorter in proportion; they are pale with brown tips, and the base of each is amber-brown; several minute hairs are dotted over the side, about ten on each segment on either side; all the hairs are serrated. The spiracles are rather prominent and brown; behind each spiracle are two pale false spiracles, only slightly darker than the ground colour. The head is very pale greenish yellow, with black eye-spots and brown mouth-parts; the entire body, including the legs and claspers, is of a pale green, and the whole surface finely cellular. They feed chiefly on the under side of the leaves, and when moulting usually lie along or quite near the midrib.

Second moult, July 2nd, the second stage also lasting five days.

Before third moult it measures $\frac{3}{8}$ in. long, similar to previous stage in general structure excepting several additional hairs, and it is studded with white clubbed processes resembling frosted glass. The colour is a clear light green, with slightly darker green medio-dorsal and lateral longitudinal lines and oblique side stripes. The head is shining pale ochreous-green, eye-spots black, and mouth-parts brown. In this stage they perforate the leaf, eating large holes all over it.

Third moult and last, 7th July, the third stage also occupying only five days.

After third moult, fully grown, it measures from $\frac{3}{4}$ in. to $\frac{13}{16}$ in. long. The dorsal surface forms a complete curve from the first to last segment, and has no longitudinal dorsal furrow; the sides are sloping to the lateral ridge; the ventral surface is much flattened, overlapping the claspers and legs, completely hiding them; both the anterior and posterior segments are rounded and projecting, the former quite concealing the head, which is withdrawn into the segment while at rest; the body is widest at the fifth segment, the head is rather small, shining, and of a very pale ochreous greenish; eye-spots black, mouth-parts brown; the segments slightly humped dorsally; the segmental divisions inconspicuously defined. The whole colouring is a clear brilliant green, with slightly darker markings showing in certain lights, of which the oblique side stripes and dorsal lines are the plainest; the spiracles are outlined with rust-brown. The entire surface is sprinkled with tiny pure white knobs on short stalks, resembling rough frosted glass formed almost exactly like young unexpanded mushrooms; also short spinous serrated hairs are densely strewn over the whole surface, the longest cover the dorsal and lateral regions, most have the apical half brownish, but many are extremely small and indistinct, being wholly green like the body. The surface is finely granulated, of a cellular pattern, the legs and claspers are closely united, being placed almost touching at the base of each pair, occupying a medio-ventral line. They are sluggish in their

movements, crawling with a slow gliding motion, but eat voraciously, and grow rapidly.

The first one pupated on July 12th, again occupying five days in the last larval stage. In each stage the first one was rapidly followed by the greater part of the large number I had under observation, so that the dates given apply to the majority. The larval state occupies only twenty-one days.

Directly after pupation the colour is ochreous yellow, changing through greenish, and the markings gradually deepening. All the markings are clearly defined in ninety minutes after pupating; in twenty-four hours the colouring and markings are perfected.

The pupa measures in length from $\frac{7}{16}$ to $\frac{1}{2}$ in., and $\frac{1}{4}$ in. in width; it is stout, dumpy, and rounded. Side view: the head is slightly angular, due to the ridge in front; thorax convex; abdomen forms a complete curve to the anal extremity, which is ventrally much compressed, and clothed with cremastral hooks; the ventral surface forms almost a straight line. Dorsal view: head rounded, swollen across the thorax, concaved in the middle; abdominal segments swollen and rounded, widest at the third and fourth segments; anal extremity bluntly attenuated. Colouring of head, thorax, and wings pale ochreous; a dusky brown medio-dorsal longitudinal line; abdomen pale ochreous-brown dorsally, oblique yellow ochreous stripes bordered below by a dark brown band spotted with buffish white, two to three spots on each segment; rest olive-brown, blending into ochreous at the extremity; spiracles prominent and whitish; thorax speckled subdorsally with olive-brown. The whole of the head, thorax, and abdomen sprinkled with minute whitish floral vase-like processes, expanding into clefted petal-like formations surrounding the mouth of the vase; also the surface is covered with tiny circular discs, and raised dark brown and black reticulations of an irregular network pattern; also on the head are numerous minute white hairs with branching tips—the whole forming a wonderfully elaborated decorative surface. Before emergence the entire colouring deepens until the final coloration of the imago shows through the shell. It is firmly attached to a stem of the plant or under surface of the leaf by a girdle round the middle, and the cremastral hooks securely anchored to a pad of silk spun on the surface.

The first (a male) emerged July 23rd, 1906, followed by a large number of both sexes daily, until the end of the month. About an equal proportion of sexes emerged.

During the middle of August I received living females from Colmar, which deposited freely upon dock and sorrel. The eggs hatched at the end of August and beginning of September. They fed and grew much slower than the summer broods. During September they moulted once, and entered into hibernation in

the beginning of October. In December I examined the two plants upon which they hybernated, and found all those upon the living plant of dock (with plenty of green leaves) were dead, while a large number of those upon the plant that had died down with only brown shrivelled leaves were alive and apparently healthy, hybernating in the folds of the damp dead leaves. Before hybernating the larva gradually changes to a more or less lilac hue, which chiefly forms broad medio-dorsal, subdorsal, and lateral longitudinal bands, which are separated by more or less greenish stripes.

This remarkable change of colour from pure green (a colouring retained unchanged throughout its existence in summer) is an instance of wonderful adaptation of protective colouring assumed entirely to harmonise with its surroundings while hybernating; the dull lilac and greenish produce a most protective combination of colour, and render the larva very inconspicuous on the dead leaves. After hybernation and before the second moult they gradually lose the lilac colouring, and assume the normal green.

On February 27th, 1907, I examined the plant, and noticed several alive; some were crawling actively about, and a few were on the under side of the young freshly grown leaves, while others were still hybernating in the folds of the dead leaves.

Among the large number of specimens bred during last summer great variation exists on the upper side of the females; some have the coppery orange colouring suffused over the secondaries, with only faint dusky linear markings between the nervures, these wings appearing unicolorous with the primaries, and the latter with small dusky spots; others have secondaries of a uniform brownish black to the marginal coppery band, and with large spots on the primaries. Every gradation occurs between these two forms in the series bred, including the interesting gynandrous specimen figured on p. 145, which appears a very complete example of gynandromorphism, even as far as the antennæ and genitalia; also the partial coloration of the abdomen.

Upon microscopical examination I find the pupa of var. *rutilus* identical in structure in every detail to that of *dispar*, excepting the specimen measured of the latter is a trifle larger, measuring $\frac{9}{16}$ in. in length. From the descriptions published (which are vague) of the larvæ of *dispar*, they agree with that of *rutilus*. Although I believe many entomologists still consider *dispar* a distinct species, there is not the slightest doubt that the latter is merely an isolated localized form, due to climatic conditions.

ON THE BRACONIDOUS CRYPTOGASTRES.

By CLAUDE MORLEY, F.E.S., &c.

THE Cryptogastres form a small and natural group in the family Braconidæ, and are so often bred out of lepidopterous larvæ that perhaps a succinct account of them may not be out of place. I was led to look through the specimens in my collection by the great number of individuals which were on the wing during last year, and, as some of these appear of unusual occurrence, I have added a few notes on their habitats and time of appearance. The group, as a whole, may be at once recognized from all the other Parasitica by the dorsum of the abdomen—appropriately termed the “carapace” by Marshall—being composed of but a single piece through the fusion of the three basal segments, though occasionally the sutures are more or less visible, always, however, connate and firmly soldered together, and never with a flexible connecting membrane, as in the Ichneumonide. They are all dull and rugose insects, usually black, though sometimes more or less testaceous or fulvous. I shall be very thankful at all times for bred hymenopterous parasites.

The six British genera may be thus distinguished:—

(8)	1. Wings clouded ; abdomen elongate (Chelonidæ).	
(5)	2. Abdomen dorsally trisegmented.	
(4)	3. Intermediate tibiæ strongly sinuate externally PHANEROTOMA.	
(3)	4. Intermediate tibiæ straight SPHÆROPTERYX.	
(2)	5. Abdomen dorsally entire.	
(7)	6. First cubital cell of upper wing entire CHELONUS.	
(6)	7. First cubital cell bisected by a nervure ASCOGASTER.	
(1)	8. Wings hyaline ; abdomen subovate (Sigalphidæ).	
(10)	9. Second segment longer than third, two following visible ALLODERUS.	
(9)	10. Second segment shorter than third, remainder concealed SIGALPHUS.	

The usual distinctions between these two families seem to me too slight to be retained ; from the Chelonidæ, the Sigalphidæ is known by having three instead of two cubital cells (which does not hold in *Ascodaster*), and the reflection of the ventral borders and length of the concavity cannot be seen in carded specimens. *Phanerotoma* and *Sphæropteryx* I have not met with, and but a single species of each—*P. dentata*, Panz.,* and *S. irrorator*, Fab.—occurs in Britain. Marshall gives a somewhat unsatisfactory table of the European Cheloni—or, I should perhaps say, treats them unsatisfactorily, since there is no table. He first presents

* Since this was written I find that I swept a single *Phanerotoma dentata* in Tuddenham Fen, Suffolk, on 27th August, 1906.

all the males and females which will work in together, and then goes on with those males which will not so accommodate themselves, ending with both sexes of *Ascogaster*, as forming a distinct division of the same genus, from which the central nervure bisecting the cubital cell forms a much better character than is often obtainable for superficially very distinct genera, e.g. *Ascogaster* and *Sigalphus*.

CHELONUS, Jur.

- (32) 1. Tegulae infuscate or black.
- (19) 2. Antennæ of female more than 16-jointed; male anus entire.
 - (4) 3. Abdomen mainly red 1. *westmali*, Curt.
 - (3) 4. Abdomen black or only basally pale.
 - (16) 5. Radius apically arcuate, and, in lower wing, centrally curved.
 - (11) 6. Hind tibiæ basally, and base of their tarsi, red; length, 5-6 mm.
 - (10) 7. Parastigma infuscate; frontal impression rugose.
 - (9) 8. Antennæ centrally dilated and apically constricted 2. *inanitus*, Linn.
 - (8) 9. Antennæ setiform throughout 3. *submuticus*, Wesm.
 - (7) 10. Parastigma testaceous; frontal impression nitidulous 4. *speculator*, Msh.
 - (6) 11. Hind tibiæ basally, and their tarsi entirely, black; length, 8-4 mm.
 - (13) 12. Frontal impression rugose and not carinate 5. *corvulus*, Marsh.
 - (12) 13. Frontal impression nitidulous and centrally carinate.
 - (13) 14. Abdomen immaculate; hind tibiæ broadly red centrally 6. *carbonator*, Msh.
 - (14) 15. Abdomen basally flavous; tibiæ narrowly red centrally 7. *decorus*, Marsh.
 - (3) 16. Radius straight, and, in lower wing, basally curved and nearly straight centrally.
 - (18) 17. Antennæ 32-jointed, longer than body; size, 3 mm. 8. *catulus*, Marsh.
 - (17) 18. Antennæ 28-jointed, not longer than body; size, 2½ mm. 9. *pusio*, Marsh.
 - (3) 19. Antennæ of female 16-jointed; male anus apically cleft.
 - (*) 20. Anal cleft nine times longer than broad 10. *risorius*, Reinh.
 - (**) 21. Anal cleft at most thrice longer than broad.
 - (**) 22. Abdomen black; size at least 2 mm.
 - (**) 23. Head cubical and cheeks buccate.
 - (**) 24. Thorax elongate; antennæ 25-jointed 11. *secutor*, Marsh.
 - (**) 25. Thorax normal; antennæ of male 28-jointed 12. *exilis*, Marsh.

(23) 26. Head transverse and cheeks normal.
 (28) 27. Femora of female entirely testaceous; male cleft, elongate 13. *latrunculus*, Msh.
 (27) 28. Femora mainly black; male cleft, transverse.
 (30) 29. Anus of female emarginate below; male antennæ at least 27-jointed 14. *paricornis*, H.-S.
 (29) 30. Anus of female entire; male antennæ at most 25-jointed 15. *sulcatus*, Nees.
 (22) 31. Abdomen basally flavous; size, $1\frac{1}{2}$ mm. 16. *basalis*, Curt.
 (1) 32. Tegulæ testaceous.
 (34) 33. Face of male obsolete pubescent; female antennæ 16-jointed 17. *dispar*, Marsh.
 (33) 34. Face of male densely pubescent; female antennæ 18-jointed 18. *canescens*, Wesm.

Chelonus inanitus.—The most abundant species of the whole group, occurring in meadows and marshy situations everywhere from 11th June to 12th September, but very rarely bred. I have but once bred it, and then from an unknown host, at Lowestoft. It is commonly swept from reeds, oats, &c., and frequents the flowers of angelica, heracleum, thistles, fennel, carrot, meadow-sweet, mallow, and *Limonium statice*. There are ninety-six specimens in my collection, taken at Parknasilla, in Ireland (Yerbury); Shere, in Surrey (Capron); Felden, in Herts (Piffard); Totland Bay, in Isle of Wight (Newbery); Tostock, Benacre Broad, and Southwold, in Suffolk (Tuck); West Runton, in Norfolk (Wainwright); Abinger Hammer, near Guildford (Butler); Oulton Broad (Bedwell); New Forest (Miss Chawner); Rye, in Sussex (Donisthorpe); Reigate, Greenings, &c., in Surrey (Wilson Saunders); Hastings district (Bloomfield); Epsom, Ryde, and Lyndhurst; Ringstead, Holme, and Burnham Thorpe, in Norfolk; and in Suffolk at Henstead, Claydon, Blakenham, Bayham, Alderton, Foxhall, Barnby Broad, Southwold, Monks Soham, Burgh, Peasenhall, Farnham, Dunwich, Barham, Clopton, Bealings, Grundisburgh, and Bramford.

C. speculator.—Mr. Albert Piffard has given me a female, which he took at Felden, in Herts.

C. corvulus.—Certainly uncommon. I possess it from Greenings, in Surrey, one in June, 1871 (W. Saunders); Felden, in Herts, two (Piffard); and Brighton, where I took a male on umbelliferous flowers, 28th June, 1897.

C. carbonator.—Somewhat common; I have thirteen specimens. Piffard found several females at Felden, in Herts, and I swept the males commonly from *Limonium statice* at Holme, in Norfolk, in August, 1906; W. Saunders took a male at Reigate in July, 1872; and others have occurred to me in Suffolk, at Bamford, Foxhall, Blythborough (beneath growing dock-leaves), and Westleton (by sweeping), and upon angelica and other flowers, from 8th July to 5th September.

C. secutor.—I swept one male in a marsh by the river at Brandon, in Suffolk, 25th August, 1906.

C. latrunculus.—My four examples were captured by Dr. Capron at Shere, and Mr. Piffard at Felden.

C. sulcatus.—The commonest of the small species, usually occurring in marshy situations. Harting, 11th September, 1899 (Beaumont); Greenings and Reigate (W. Saunders); Felden, in Herts (Piffard). I have found it from 8th June to 9th September at Claydon, Brandon, and Barton Mills, in Suffolk, by sweeping, and at the roots of *Senecio jacobaea*. Mr. E. R. Bankes bred five specimens from *Asychna aeratella*, Zell., at Shoreham, Sussex, June 17th to 23rd, 1895.

C. dispar.—The only specimen I have seen is a male, which was running swiftly among moss at Foxhall, near Ipswich, 13th September, 1903.

ASCOGASTER, Wesm.

- (10) 1. Trochanters mainly red.
- (3) 2. Clypeus apically truncate and centrally mueronate
 - 1. *instabilis*, Wesm.
- (2) 3. Clypeus apically rounded or emarginate.
- (7) 4. Hind tibiæ basally black.
- (6) 5. Hind tibiæ white-banded centrally 2. *annularis*, Nees.
- (5) 6. Hind tibiæ not white-banded 3. *ratzeburgi*, Marsh.
- (4) 7. Hind tibiæ basally red.
- (9) 8. Clypeus apically subbidentate; hind tarsi basally white 4. *rufipes*, Nees.
- (8) 9. Clypeus apically emarginate; tarsi basally ferruginous (5. *rufidens*, Wesm. 6. *canifrons*, Wesm.)
- (1) 10. Trochanters black.
- (14) 11. Mesonotum distinctly punctate.
- (13) 12. Clypeus apically mutic 7. *variipes*, Wesm.
- (12) 13. Clypeus apically bidenticulate 8. *bicarinatus*, H.-S.
- (11) 14. Mesonotum rugosely reticulate.
- (16) 15. Abdomen only basally testaceous 9. *elegans*, Nees.
- (15) 16. Abdomen not, or mainly, fulvous.
- (18) 17. Frontal impression deep and laterally bordered
 - 10. *armatus*, Wesm.
- (17) 18. Frontal impression shallow and not bordered
 - 11. *quadridentatus*, Wesm.

Acrogaster instabilis.—Widely distributed. I possess several taken at Felden by Piffard; and single specimens at Ravenscraig, on 17th June, 1899, by Dalglish; and at Greenings, in Surrey, in June, 1871, by W. Saunders.

A. annularis.—I have only seen one male, captured by Mr. E. A. Newbery in his house at Dartmouth Park, London, and thought by him to be probably parasitic on clothes-moths (it has been bred from *Ecophora lambdella* in Devon).

A. rufipes.—Rev. C. D. Ash gave me one in June, 1902, which he had just bred from Aberdeenshire *Euchromia flammeana*;

Piffard took several from Felden, in Herts; and I swept, on 28th August, 1906, a specimen in Tuddenham Fen, Suffolk.

A. rufidens.—A common species, taken by Dalglish at Irvine and Bishopton in July; by Piffard at Felden; by Rev. E. N. Bloomfield at Guestling, in Sussex, in 1877; and by myself on umbelliferous flowers at Bildeston, in Suffolk, 30th July, 1898. This species has the clypeus apically tridentate, and not, as in *A. canifrons*, obsoletely unidentate centrally.

A. variipes.—Not uncommon in damp spots. I took it in Wicken Fen, Cambridgeshire, 8th June, 1902; in Henstead marshes, Suffolk, by sweeping, 3rd July, 1906; and possess others from Felden, in Herts.

A. armatus.—A rare and conspicuous species, of which I have only seen two examples, both taken in August; one at Reigate in 1872 by Wilson Saunders, and the other by myself in Mr. Adams's garden at Lyndhurst, on 8th, 1901.

A. quadridentatus.—Very common. Mr. E. R. Bankes has thrice bred it: nine specimens emerged at Corfe Castle, Dorset, between June 20th and July 4th, 1901, from larvæ of *Sericoris bifasciana*; one emerged in the same locality on June 26th, 1901, from (probably) *Acrolepia granitella*; and between May 4th and 25th, 1900, sixteen were bred from larvæ of *Lozopera francillonana*, in stems of *Ferula communis* collected at Ile St. Marguerite, Cannes, by Chapman the preceding spring. I have thrice received it from Dr. Chapman. On the first occasion (1st June, 1900) about twenty were bred, with a single male of *Bracon pectoralis*, Wesm., from *Lozopera francillonana* at Cannes; secondly (29th April, 1900), one emerged from the larval case of *Psyche tenella* var. *zermattensis* at Locarno or Cannes in March or April; thirdly (2nd May, 1900), one was bred at Cannes from the first-named host; and, lastly (17th May, 1901), a single specimen emerged from a larva of both *Lozopera deaurana* and of *L. francillonana*. Tuck has captured it at Tostock, in Suffolk, 20th July, 1900; I have found it on umbelliferous flowers at Grundisburgh on 25th July, 1898, and swept it in Bentley Woods, 15th June, 1895; Wilson Saunders found it at Greenings, in Surrey, in June, 1871; and Col. Yerbury, at Nairn, on 7th June, 1904.

I have not met with the only British species of *Alloderus-lepidus*, Hal.—which may be known from the three other palæoarctic species by its rugose third segment, which is not centrally carinate, and by the antennæ being at least 29-jointed, with the terebra as long as the abdomen.

SIGALPHUS, Latr.

| | |
|--------------------------------------------------------------------------|------------------------------|
| Head and thorax red | 1. <i>thoracicus</i> , Curt. |
| Head and thorax black. | |
| Frons with inter-antennal tooth; abdominal sutures
obsolete | 2. <i>ambiguus</i> , Nees. |

| | |
|---------------------------------------------------------------------------|--------------------------------|
| Frons mutic ; abdominal sutures distinct. | |
| Second suture subobsolete ; legs clear red | 3. <i>pallidipes</i> , Nees. |
| Second suture distinct. | |
| Femora testaceous, rarely black-rayed. | |
| Antennæ 29-jointed ; terebra as long as body | 4. <i>caledonicus</i> , Marsh. |
| Antennæ at most 26-jointed ; terebra shorter than body | 5. <i>luteipes</i> , Thoms. |
| Femora black, rarely apically red. | |
| Antennæ at least 27-jointed ; length, 3 mm. | 6. <i>striatulus</i> , Nees. |
| Antennæ at most 25-jointed ; length, 1 to 2 mm. | |
| Terebra longer than body | 7. <i>caudatus</i> , Nees. |
| Terebra much shorter than body. | |
| Abdomen broadest at the not apically striate third seg-
ment | 8. <i>floricola</i> , Wesm. |
| Abdomen broadest beyond the entirely striate third seg-
ment | 9. <i>obscurellus</i> , Nees. |

Only four species are known to me, but they are all about equally common :—

Sigalphus luteipes.—Taken by Mr. Tuck at Benacre Broad and Aldeburgh, in Suffolk, in August and September ; and by myself by sweeping at Bramford, and on angelica flowers at Kenton, in the same county ; and at Ryde, in the Isle of Wight.

S. caudatus.—Felden, in Herts (Piffard) ; Kilmore, in August (Beaumont) ; Greenings, in Surrey, July, 1872 (W. Saunders) ; Aldeburgh, in September (Tuck) ; Needham, Ipswich, and Claydon, in Suffolk.

S. floricola.—I have swept this species from reeds at Southwold, on the Suffolk coast, 28th September, 1900 ; Piffard has found it at Felden ; and Donisthorpe has bred it from the weevil, *Ceuthorhynchus sulcicollis* (cf. Trans. Ent. Soc. 1907).

S. obscurellus.—Blackheath, in July and August, 1899 (Beaumont) ; Reigate, in July, 1872 (W. Saunders) ; Aldeburgh, in September, 1899 (Tuck).

Monks Soham House, Suffolk :
2nd May, 1907.

A BIBLIOGRAPHICAL NOTE ON SOME JAVANESE SACCHARICOLOUS THYSANOPTERA.

By G. W. KIRKALDY.

IN 1890 W. Krüger described* *Thrips sacchari* and *Phlaeothrips lucassenii*. Two years later J. D. Kobus described *T. serrata*, *binervis*, and *striatoptera*,† and in 1898 Kobus reprinted his

* "Ber. Versuchst. West-Java," Hefte 1 and 2. † "Med. Proefst. Oost-Java," No. 43. Both these probably published in the 'Archief voor Suiker-industrie,' 1890 and 1892 respectively.

paper.* In 1899 Krüger rediscussed these species,† including also some described by Zehntner in 1897. These papers are not reported by the 'Zoological Record,' or (apparently) by the 'Bericht der Entomologie,' and the species were not included by Uzel in his monograph.

NOTES AND OBSERVATIONS.

NOTE ON THE DISPERSAL OF BUTTERFLIES.—I was interested, when on the north-west coast of Madagascar, to have presented to me on the same day—May 26th, 1907—an instance both of the natural and what I may call the artificial means by which butterflies are dispersed. Regarding the latter, when the ship was loading some highly odoriferous hides in Majunga harbour, about six specimens of *Crenis madagascariensis*, Boisd. persisted in flying about the ship, regardless of the crowd of passengers, the noise of winches, and general turmoil and confusion. They also flew down the hatchway through which the cargo was being passed, being, I presume, attracted by the smell of the hides. One specimen actually took up its position for the night half way down the hatch, was comfortably covered up and conveyed, I have no doubt, safely to our next port, Mayotte, one of the Comoro group, where we arrived early the following morning. No doubt it went ashore, and quite likely reproduced its species. The former method of dispersal was illustrated the same evening, when we were about twenty miles from Majunga, steering a little north of west. There was a fairly stiff westerly breeze, and just after sunset I noticed a large *Papilio*—black and yellow with very pronounced spatulate tails to the hind wings—being driven by the wind over the ship. The butterfly kept head to wind, and made no attempt to battle against it, but allowed itself to be carried along, merely keeping a certain height above the water. There was a full moon at the time, and it was a beautiful starlight evening, and I have no doubt the butterfly arrived safely at some point on the Madagascar coast during the night. It must have come at least one hundred and fifty miles, *i. e.* if it came from any of the Comoro Islands. I do not know whether any such butterfly occurs on any of these islands (I did not observe it at Mayotte), and if it does not it must have come from the east coast of Africa, across the Mozambique channel, a distance of some two or three hundred miles. I may mention that some years ago a fine specimen of *Papilio hector* came on board our steamer at 9 p.m., the evening before we arrived at Colombo. I have in my collection a specimen of *Euplaea gondoti*, captured at Flacq on the east coast of Mauritius. It is a species peculiar to Réunion, and quite unknown in Mauritius. This insect was in all probability carried by the wind from the one island to the other; though the extreme rarity of such an occurrence is shown by the fact that, though of a tough constitution and well able to withstand rough usage, it has not succeeded in

* 'Bijlage Arch. Java-Suikerindustrie,' 1898, 154-8, figs. 1-4.

† 'Das Zuckerrohr und Seine Kultur,' 320 and 390-6, figs. 52-5.

establishing itself in Mauritius. When we consider, however, that the island is only thirty-six miles in expanse, and therefore a mere speck in the vast expanse of the Indian Ocean, the chance of an involuntary migrant from Réunion, though only one hundred miles off, landing safely in Mauritius is exceedingly remote. I have also a mangled male specimen of *H. bolina*, which was taken close to the harbour of Port Louis; it probably came in some steamer, possibly from the Seychelles. I have only seen one other Mauritius specimen, which is a female, and it also was taken close to the town.—N. MANDERS; Lieut.-Col. R.A.M.C.

THE HAWAIIAN ENTOMOLOGICAL SOCIETY.—Founded in December, 1904, and the first regular meeting held in January, 1905, this little society has already published three parts of its 'Proceedings,' amounting to 112 pp. and 2 plates; while Part 4, with about 40 pp. and one or two plates, is in the press. The society has the distinction of being the only entomological society—or at least the only one publishing—outside of Europe and North America. Its principal object is the study of Hawaiian insects, though other topics are not neglected. The most interesting papers in Part 3 are (1) by Dr. Perkins, describing a new species of *Proterhinus* from Samoa, this isolated genus being only known from the Hawaiian Islands previously; (2) by O. H. Swezey, describing a new genus of Asiracidae, *Dictyophorodelphax*, with enormously elongate head, resembling that of certain *Dictyophorinæ*.

NOTE ON THE LARVA OF *SCOTOSIA RHAMNATA*, Schiff.—When examining the leaves of a buckthorn-bush near Midhurst last summer I discovered two nearly full-fed larvae of this species. In colour they closely resembled the larvae of *Gonepteryx rhamni*, L., and rested in similar manner on the upper side of the leaf along the midrib, holding on near the base of the leaf with the claspers, slightly arching the abdominal segments away from the leaf, and bending down the thoracic segments so as to touch the leaf again at the apex. They are not easy to see, as they assimilate so well with the general appearance of the leaf, and even when seen may easily be passed over as larvae of *G. rhamni*. The first moth emerged on 5th July and the second the day following.—H. LEONARD SICH; Midhurst, July, 1907.

PORTHESSIA CHRYSORRHœA.—Reading Mr. Adkin's note (p. 164, *ante*) on the distribution of this species, I recall that when I was at school at Folkestone, and during the summers of 1877, and I think also 1878, we used to come across the larvae in some numbers. I have forgotten the exact locality, but if my memory serves me rightly, it was somewhere along the lower Sandgate Road; probably in the underwood of the little copses near to the sea which were then apparently just planted. I have never collected in the neighbourhood since, and would be interesting to hear whether the migrants of subsequent generations have established themselves in or near the old haunt. I 'La Feuille des Jeunes Naturalistes' notices have recently been published of the abundance and also of the disappearance in some localities of *chrysorrhœa* across the Channel in France.—H. ROWLAND BROWN; Oxhey Grove, Harrow Weald, July 8th, 1907.

THE TROPHONIUS FORM OF *PAPILIO CENEAE*.—From notes by Roland Trimen, F.R.S., &c., and G. A. K. Marshall, F.E.S. and myself, in my paper on *P. cenea*, Trans. Ent. Soc. of London, December, 1904, page 687, I fancy the proportion of the above form of the female has been underestimated, and I think a report of the captures, &c., of this form during the end of April and up to the 18th of May may be of sufficient interest to record. I have been taking careful observation myself, and also asked the following collectors to let me know of their captures of this rare form, and they are as follows:—April 27th, saw one at Umbilo, near Durban, G. F. Leigh. May 5th and 13th, captured one at Durban, G. F. Leigh. May 18th, saw one in the town, Smith Street, Durban, G. F. Leigh. May 5th, captured three, Overport, Durban, A. H. Clarke. May 3rd or 4th, seen by Mr. A. D. Millar, in Ridge Road, Durban. May 3rd, captured on the Bluff, Durban, Mr. Green. May 1st, captured by Mr. Berensberg, Durban. This is all I have heard of, but no doubt other collectors, not known to me, have also taken specimens. It seems to me that this is a very unusual number to be accounted for in about a month, but probably my asking these gentlemen to let me know how many they took caused them to be more keen in hunting up this insect. It might easily be mistaken on the wing, no doubt, for *Danais chrysippus*, unless a careful look-out was kept. I have seen several of the specimens mentioned and only two of them were varieties. Both were slightly damaged, the one taken by Mr. Berensberg, and the one taken by myself on May 13th; both have brown markings in the white spots at the tip of the fore wings. The specimen seen by me to-day in one of the busy streets in town must have flown out from the Albert Park, where this species is fairly common at certain times of the year.—G. F. LEIGH; Durban, Natal, May 18th, 1907.

ON THE DISCOVERY OF THE FOOD-PLANT OF *ACIPTILIA (BUCKLERIA) PALUDUM*, Zell.—Few entomological problems have resulted more satisfactorily than the finding out of the food-plant of this pretty little moth. It has been a problem of much interest to myself, having worked at it for many years, though its solution is entirely due to Mr. Eustace Banks, who fortunately obtained the practical skill of Dr. T. A. Chapman in finally working out the full proof of the problem's solution. *Aciptilia paludum* had, by the year 1886, become practically a lost British insect, when it was found in fair abundance by myself and my sons in a small bog on Bloxworth Heath.* The moth occurred here regularly every succeeding season, as well as, less abundantly, later on in the Isle of Purbeck, where it was met with by the Rev. C. Digby and by Mr. Eustace Banks. Of course our ambition now was to find out its food-plant and manner of life. We gradually exhausted the list of plants growing where the insect appeared; all our efforts, however, to guess, or to pitch upon, the right plant, whether by accident or design, failed for nearly twenty years. There remained, however, one plant—the sundew (*Drosera*)—whose likelihood to be the true one certainly never crossed our minds;

* See 'Proceedings of the Dorset Natural History and Antiquarian Field Club,' vol. viii, p. 57, Pl. ii, fig. 4, 1887.

though Mr. Bankes tells me that it did occur to him some few years ago, but only to be dismissed at the time as an untenable idea. Probably there was scarcely then an entomologist living who would not have at once almost scouted the idea that this plant could in any way furnish food for the larvæ of such a delicate little insect; a plant so apparently, by its peculiar powers and predilections, inimical to insect-life. Another circumstance also tended to prevent the discovery of the larva, inasmuch as no female of this moth had ever, certainly in our experience, been found to have laid any eggs after capture. However, matters went on with the problem still unsolved, from 1886 to 1904, when, on the 20th of August in that year, Mr. Bankes came over to Bloxworth to endeavour to obtain the insect once more in its original haunts, if haply he might get females, and obtain a batch of eggs, with a view to experimenting upon the larvæ with the unlikely sundew. Mr. Bankes that evening captured a number of the insect, among them being several females, from one or more of which a few eggs were obtained. Plants of several kinds were put in for the moths to lay their eggs upon, among the plants a stem of *Drosera*, and only upon this such eggs as were obtained, or at any rate most of them, were deposited. The eggs were at once placed by Mr. Bankes in Dr. Chapman's hands, with a supply of sundew, and the succeeding efforts and unwearying care bestowed upon the problem by Dr. Chapman are related at great length by himself in his paper on the subject in the 'Transactions of the Entomological Society of London,' 1906, pp. 133-154, Pl. vii. One of the most curious facts arising out of the rearing of this insect was that the part of the sundew which one would have supposed would be carefully avoided by the minute and delicate larvæ was the very part specially devoured by them, that is the glutinous secretion with which the foliage of the plant is furnished, and with the aid of which it is wont to supply its own need of insect-food. With the clue thus given, by Mr. Bankes' efforts, larvæ were found in the following May (1905) by Dr. Chapman, in the Esher district of Surrey, upon the sundew growing there, and from these, towards the end of June, the perfect insects were bred. Thus, though Mr. Bankes' larvæ failed to produce the perfect moth, the finding through his clue by Dr. Chapman of others in their natural state, and the rearing of the insect from them, has settled this very interesting twenty-year problem.—O. PICKARD-CAMBRIDGE; Bloxworth, June 25th, 1907.

THE ENTOMOLOGICAL CLUB.—A meeting was held on March 19th last, at 27, Hereford Square, S.W., the residence of Mr. A. J. Chitty, the host and chairman of the evening. The other members present were Messrs. Adkin (R.), Donisthorpe, Hall (T. W.), Porritt, and Verrall. There were also fourteen visitors.

On the invitation of Mr. G. T. Porritt, of Huddersfield, a meeting was held at the 'Hand and Spear' Hotel, Weybridge, on July 8th last. Seventeen sat down to supper, including the following members:—Messrs. Adkin (R.), Chitty, Donisthorpe, Hall, and Porritt.

CAPTURES AND FIELD REPORTS.

AMPHIDASYS VAR. DOUBLEDAYARIA IN NORTHAMPTONSHIRE.—It may interest readers of the 'Entomologist' to know that a female specimen of *Amphidasys betularia doubledayaria* was picked up here a few days since.—N. CHARLES ROTHSCHILD; Ashton Wold, Oundle, Northamptonshire, July 10th, 1907.

SESSIA ANDRENIFORMIS BRED.—From a small faggot of mined sticks of dogwood that I collected, quite a large number of parasitical flies have come forth, but, I am pleased to add, one example of *S. andreniformis* also. The latter emerged on July 18th last.—J. OVENDEN; Frindsbury, Rochester.

COLIAS EDUSA IN THE ISLE OF WIGHT.—I saw a specimen of *C. edusa* to-day, June 28th. The butterflies have not appeared to be numerous yet. Amongst those observed are the following:—*Pamphila sylvanus*, *Cupido minima* (common), *Lycæna icarus*, *L. bellargus*, *Callophrys rubi*, *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Euchloë cardamines*, *Vanessa io*, *V. urticæ*, *Pyrameis cardui*, *P. atlanta*, *Pararge megæra*, *P. egeria* (both common), *Canonympha pamphilus*.—JOHN WRIGHT; Freshwater, June 28th, 1907.

SPHINX CONVOLVULI IN ISLE OF WIGHT.—On July 9th, at Ventnor, I took a specimen of *Sphinx convolvuli* which, no doubt, had been brought here by the high wind which had been blowing on the two previous days, but the date is surely an early one for its capture. This appears to be a very disappointing season for entomologists, a week's collecting in Parkhurst Forest showing meagre results. Usually I have found *Limenitis sibylla* very abundant there at this date, but I only saw one. The lateness of the season would scarcely be sufficient to account for this. *Argynnis paphia* was flying, but not common. Generally I have taken *A. aglaia* and *A. adippe*, but none were to be seen. *Melanargia galathea* only in small numbers. In previous seasons I have done well in Parkhurst Forest. It would be interesting to know how collectors have fared in other parts of the country.—AWDRY DOBRÉE; Udney Hall, Teddington, July 19th, 1907.

PLUSIA MONETA AT BURTON-ON-TRENT.—It may be of interest to note that *Plusia moneta* has turned up here. I do not know how far north it has yet extended in England, but I imagine it is by no means common yet outside the southern counties. I have in my possession another specimen reported to have been taken here six years ago, but I had regarded it with some suspicion as probably a southern specimen.—A. C. HAYWARD; The Croft, Repton, Burton-on-Trent, July 5th.

CHÆROCAMPA CELERIO IN NORTH CORNWALL.—Whilst on a visit to the North Cornish coast during the latter half of June, I had the pleasure of taking a fine specimen of *Chærocampa celerio* on the evening of the 20th, about 11.30 p.m. I found it resting on the flowering stem of sorrel. It does not appear to be an immigrant, as its condition is perfect.—G. B. OLIVER; Tettenhall, Wolverhampton, July 16th, 1907.

NOTE ON DIANTHŒCIA LUTEAGO VAR. FICKLINI.—Last year a female of *Dianthœcia luteago* var. *ficklini*, captured in Cornwall, deposited three eggs in a chip box. The larvæ hatched, and were fed on the flowers of *Silene maritima* until the first moult, and having to leave the district, I put them out on an isolated plant, and in November I got the son of the people with whom I had stayed to dig up the whole plant and search among the roots for pupæ. One was found, and the moth, a female, emerged on the 14th inst. The colour of the larva, when small, is a dirty white, with a well-developed plate on second segment, and a brown head. The pupa is similar in colour and shape to that of *D. conspersa*.—G. B. OLIVER; Tettenhall, Wolverhampton, July 16th, 1907.

STAUROPUS FAGI IN WARWICKSHIRE.—On June 15th I took a fine female specimen of this moth, at 6 p.m., at rest on a sycamore trunk in Princethorpe Wood, near Rugby. I believe this to be the first imago of this species taken in Warwickshire, the only previous record being a larva taken by a Rugby schoolboy some years ago.—HUBERT Langley; Narborough House, Leamington.

PAPILIO MACHAON IN NORTH LINCOLNSHIRE.—I have to note the occurrence of *Papilio machaon* near the shore at Tetney, North Lincolnshire, in July, 1906.—F. W. SOWERBY, R.N.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*Thursday, May 23rd, 1907.*—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Brown exhibited (1), varieties of *Trachea piniperda* from Oxshott, in some the red markings were dominant and in others the green; (2), a dark *Agrotis exclamationis* from Folkestone; and (3), a very light *A. puta* from Deal.—Mr. Ashby, a long series of the ant-beetle, *Thanatus formicarius*, from Oxshott, where it had occurred commonly.

Thursday, June 13th, the President in the chair.—Mr. West, of Greenwich, exhibited the rare Coleopteron, *Triplax lacordairei*, and the uncommon Hemipteron, *Verlusia rhomboidea*, both from Darenth.—Mr. Tonge, a living larva of *Issoria latona*, reared from an ovum sent from Hyères by Dr. Chapman.—Mr. Henry J. Turner, a specimen of *Tinea cloacella* just taken in Greenwich Park, and the living larvæ of *Coleophora discordella*, sent by Mr. Wilkenson, of Workington.—Dr. Chapman, (1) living larvæ of *Calocampa exoleta*, and remarked on their curious custom of feeding on stale food-plant; and (2), varieties of *Papilio machaon*, in one of which the costa of the fore wings was much more arched than usual towards the apex, and in the other the black inner line of the dark submarginal band was wanting and the black basal circle of the ocellus was absent. Several species of larvæ were noted as having the same habit as *C. exoleta* and in their final instars voluntarily changing their pabulum.

June 27th, the President in the chair.—Mr. Sich reported he

had just seen a living specimen of *Amphidasys betularia* in Montague Street, W.—Mr. R. Adkin exhibited specimens of *Hesperia malra* var. *taras*, from near Hailsham.—Mr. West (Greenwich), three rare species of Coleoptera from Darentin Wood, viz., *Cryptocephalus 6-punctatus*, *Apoderus coryli*, and *Byctiscus betuleti*.—Mr. Carr, the remarkable pupa of *Hylophila bicolorana*, which was taken during the Society's field meeting at Fetcham Common.—Mr. Schooling, (1) a variety of *Euchelia jacobaeæ* having the apical spot united with the submarginal blotch; (2) a variety of *Bapta temerata* having the two dark costal markings closely approximated; and (3), short bred series of *McLanthia abicillata* and *Boarmia abietaria*.—Mr. Main reported that, in the Isle of Wight, he had met with a few *Melitæa cinxia* and had obtained ova. *Cupido minima* and *Agriades bellargus* were also flying. He noted the females of the latter species as being unusually blue.—A discussion took place as to the green tinge apparent in many white Lepidoptera for a short time after emergence.—Mr. Adkin reported that he had just bred *Tortrix pronubana*, and thus proved it to be double-brooded. Probably it was continuously brooded in its usual habitat.—Mr. Adkin then gave a short account of the Congress of the S. E. Union of Scientific Societies, held at Woolwich from June 12th to 15th.—*H. J. TURNER, Hon. Rep. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—May 7th, 1907.—Rev. C. R. N. Burrows exhibited *Acronycta auricoma*, ex Sabine collection, labelled Abbots Wood, but undated; also *Tenioampa stabilis* ab. *pallida* (Tutt), Mucking, 1903, *Mamestra anceps* ab. *renardii* (Bdo.), Mucking, 1902, and ab. *ochracea* (Tutt), Rainham, 1896, and hybrid (?) *Oporobia dilutata* \times *christyi*.—Mr. J. A. Clark, *Anarta cardigera*, Bannoch, 1906.—Mr. A. W. Mera, larvae and imagines of *Oporobia autumnaria* and *O. christyi*.—Mr. T. H. L. Grosvenor recorded the occurrence of imagines of *Anarta myrtilli*, *Hesperia malra*, and *Setunia carpini* in Reigate district on May 5th.

May 21st.—*Melanippe fluctuata* was the special feature of the evening, and series from various localities were exhibited by several members; var. *costovata* was sparingly represented in most of the series, showing that the form is generally distributed, but does not seem to show any tendency to form a local race.—Mr. J. A. Clark exhibited a particularly fine series, including most of the named and some as yet unnamed forms, while Mr. Prout showed allied species collected in all parts of the world.—Other exhibits were as follows:—Mr. S. J. Bell, larvae of *Polia chi* in last stadium, bred from Yorkshire ova.—Mr. J. A. Clark, *Aleucis pictaria*, bred from ova laid by Epping Forest female.—Dr. G. G. C. Hodgson, ova of *Gonepteryx rhamni*, which he had observed to be generally found in groups of three or more on a single leaf; as he found that these batches usually hatched simultaneously, he suggested that the female evidently lays more than one ovum on a leaf, this being contrary to what he believed to be the general impression.—Mr. L. W. Newman, larvae of *Argynnис paphia* in penultimate stadium, bred *ab ovo*; also pupæ of *Aporia crataegi*, bred from ova laid by East Kent female.—Mr. J. Riches, almost full-fed larvae of *Polia flavocincta*.—*S. J. BELL, Hon. Sec.*

RECENT LITERATURE.

Additions to the Wild Fauna and Flora of the Royal Botanic Gardens, Kew. III. Lepidoptera. By A. LANGLEY SIMMONS. ('Bulletin of Miscellaneous Information,' No. 5, 1907.)

WORKING out the fauna and flora of a small, well-defined area—always an interesting process—promises for Kew Gardens to prove of special interest. Within the bounds of the Gardens no great acreage is enclosed, yet it is wonderful how rich and varied a fauna has already been found existent therein, and at present the lists of species noticed for most groups of animals can be described as "preliminary" only.

In the contribution before us we have thirty-one pages of matter, illustrated by one plate—a flash-light photograph of a "sugar-patch" with eight specimens of *Noctua xanthographa*. Mr. A. L. Simmons, with Messrs. G. Nicholson and A. Sich as coadjutors, must have worked hard during 1906 to add 228 species to the previous list of Lepidoptera. The newly-discovered species comprise 2 hawk-moths, 2 Notodonts, 1 Liparid, 44 Noctuids, 46 Geometers, 28 Pyralids, 43 Tortrices, 60 of the Tineina, and 2 of the Micropterygina. Some of the most noteworthy additions are:—*Triphana subsequa*, *Caradrina ambigua*, *Plusia moneta*, *Aspilates citraria*, *Chilo phragmitellus*, *Pandemis dumetana*, *Chrysoclista lineella*, *Scythris chenopodiella*, *Yponomeuta viginipunctatus*, and *Adela cuprella*. Mr. R. South was asked to examine the insects before the list was finally compiled.

Systematic work throughout the year was the means of achieving so fine a result. The insects were sought for in all stages, and most of the methods in use by collectors were employed to entrap the perfect insects. "Sugaring" was tried from April to the end of October, and in the latter part of the period with success; "light" was more or less a failure. Not a few cases of "melanism" are recorded, and these are specially interesting in this instance; but whether it is well, while the cause of melanism is under discussion, to state definitely that the soot of the Metropolis is the cause of it, seems a little open question. It is unfair, perhaps, to call attention to the only misprint seen—*jacobæa* (for *jacobææ*) on page 157.

W. J. L.

The Insect Hunter's Companion. By the Rev. JOSEPH GREENE, M.A. Being Instructions for Collecting and Preserving Butterflies, Moths, Beetles, Bees, Flies, &c. Revised and extended by A. B. FARN. Fifth Edition. London: West, Newman & Co. 1907.

If we desired to adversely criticise this modest little volume, we should do so on the lines that it does not adequately represent up-to-date knowledge. On reflection, however, we recognize the fact that whatever information happens to be available at the present day has been largely acquired by those who may very possibly have started their entomological studies under the guidance of books such as this. Further, we appreciate the reviser's observations in the preface to this, the fifth edition, where he remarks "that it has been sought to leave untouched, as far as possible, the information as first given"; and, again, "I should wish that the memory of the late Rev. Joseph Greene should live long, not only with his contemporaries, but that it should be transmitted through many generations of entomologists yet to come."

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VARIETY OF *MELITAEA ATHALIA* VAR. *EOS*, HAW.

By F. W. FROHAWK, M.B.O.U., F.E.S.



THE accompanying figures represent a very beautiful variety of *Melitaea athalia* which I had the pleasure of capturing on June 23rd last, in Sussex. As will be seen by the drawing, the black basal markings of the primaries are intensified and suffused, and are almost absent over the rest of these wings except the dark marginal band; excepting the small indistinct discal spot, a submarginal series of fulvous spots and a streak of the same colour along the inner margin, the secondaries are wholly blackish. The under surface is unusually handsome; the primaries have two large discal black spots and bold black bars through the central area, and a submarginal series of small black spots; the secondaries have the basal portion boldly marked with black and fulvous, a broad, plain, creamy-white, median band, followed by series of fine black crescents and fulvous spots, and a submarginal row of small dusky lunules on a bright straw-yellow ground colour. All the fulvous colouring is particularly bright and rich. The specimen is in very perfect condition, apparently emerged just previous to capture.

In the 'Entomologist' for June, 1877, vol. x. p. 145, are figures of both upper and under sides of an almost identical

variety of this species, with accompanying notes by the late Mr. S. Stevens. This particular specimen was captured one hundred and four years ago (1803) "at Peckham, near London," by Mr. Howard, and recorded in the old Entomological Society's Proceedings, and figured in J. F. Stephens's 'Illustrations of British Entomology,' vol. i. 1828, and copied into Humphrey's and Westwood's 'British Butterflies,' 1841, pl. 8, figs. 13, 14; as these works are scarce, Mr. Stevens considered it desirable that fresh figures of the insect should be given in this journal thirty years ago. He states, at the sale of Haworth's collection in 1834, which contained the specimen in question, it was bought by Dr. Ashburton, whose collection was likewise sold a few years afterwards, when Mr. Stevens then purchased it, and at the sale of the first portion of his fine collection at Stevens's auction-rooms, on March 27th, 1900, the specimen again changed hands. On comparing the illustrations of the two varieties, the one I now figure is apparently the most beautiful and extreme form of this variety, being further removed from typical *athalia*, and on the under side the secondaries are perfectly symmetrical as regards markings, whereas in the figure published by Stevens the markings do not correspond on these wings.

NOTES ON THE BUTTERFLIES OF DIGNE.

BY GERARD H. GURNEY, F.E.S., &c.

AFTER having been abroad, at Hyères, for three weeks during April of this year, I had not expected to have been on the Continent again until July; however, owing to a variety of circumstances, I found I should not be able to leave England either during July or August, but was able to get away for three weeks in June, which sudden change of arrangements rather, for the moment, upset my summer plan of campaign. However, this was not of such an elaborate nature but that after a little consideration I was able to adapt myself to circumstances, and decide that my three weeks abroad—or, at any rate, a part of it—should be spent at Digne; and so, after the long and rather tiring journey *via* Lyons, Grenoble, and Veynes, I found myself deposited, with my luggage, on the platform at St. Aubau Station at four o'clock on the afternoon of June 4th, where, after a short wait of fifteen minutes, another train slowly trundled me on for the short remaining half-hour it takes to get to Digne. I found a comfortable room reserved for me at the 'Boyer Mistre Hotel,' and, after a wash and a change, I went a short stroll before dinner. The evening was glorious and very warm, and my hopes rose with the thought of the rarities to be caught on the morrow, and also with the charm, which never lessens, of once

again being in the dreamy South, and in pursuit of my favourite hobby. It was six o'clock, and therefore I did not see very many insects during that first walk. A bit of wall facing south, which had been thoroughly well "baked" by the sun during the day, was the sleeping place of five or six *Pararge mœra*, which allowed themselves to be pill-boxed without any difficulty; and further along, where a gateway was let into the wall, two fine "tigers," a male *Rhyparia purpurata* and a splendidly marked *Arctia fasciata*, were resting on the door, both in excellent condition.

Next day (the 5th) broke clear and cloudless, and the weather for the remainder of my stay at Digne was, with the exception of two days, when it poured in torrents without stopping, of the most perfect description—continual brilliant sunshine without a break day after day, though the wind generally got up about one o'clock—so that it was well to be up and on one's ground as early as possible. I do not think very many entomologists choose to go to Digne at the beginning of June; May or July and August are much more favourite times. In June one is, so to speak, between two broods—the spring things are going over, and the summer insects are not yet out. This year it has been a very late season all over the South of France; the extremely cold and wintry spell of weather which there was at the beginning of March finished off the effects of a bad winter, and delayed the emergences of the butterflies, and Digne was as behindhand as everywhere else; so that I found many things which in an ordinary season would have been worn to rags still in fairly good condition. *Leucophasia duponcheli* was plentiful and generally distributed, flitting hither and thither wherever it could find some shade. Many of the males were in excellent condition, and showed but little signs of wear. A few *L. sinapis* were flying with them. Three females of *L. duponcheli*, which I had caged over a collection of *Vicias*, *Lotus corniculatus*, and *Lathyrus pratensis*, in the hope of getting ova, were one morning exposed to the direct rays of the sun, and although it was still early, and they were not in the sun for more than five minutes, yet it was sufficient to kill them all, so delicate are they. This was unfortunate, as they were the only females I came across. *Cupido sebrus* was fairly common in one or two places—i. e. on the Dourbes Road, where the first track begins to ascend the mountain after leaving the Octroi, and in the Eaux Thermale Valley, where they were flying about in company with *Everes argiades*; but by June 6th they were beginning to show distinct signs of wear. They varied somewhat in size, one male being an exceedingly small one.

Another of the special butterflies at Digne was *Melitaea deione*; this was not uncommon, and, as it was in good condition, I was able to get a nice series of this most interesting *Melitaea*—renewing an acquaintance with the Rhone Valley form, "berisal-

ensis." Other insects observed on my first day's walk along the Dourbes Road, over the ridge of La Collette and back by the Cemetery, included *Carcharodus lavateræ*, *Pyrgus sao* (common), *Chrysophanus dorilis*, *Cupido minima*, *Nomiades cyllarus* (extremely abundant, but quickly going over, though some of the females were still presentable), *N. melanops*, *Polyommatus bellargus*, with fine "ceronus-like" females (if such a term is permitted), *P. corydon*, *P. hylas*, *Rusticus argyrogognomon* (rather a fine form), one *Thecla spini* (just out), *Thaïs medisicaste*, *Parnassius apollo*, *Euchloë euphenoides*, *Melitaea aurinia* with var. *provincialis* (abundant but *passé*), *M. phœbe*, *M. cinxia*, *M. didyma*, *Polygonia egea* (worn), *Limenitis camilla* (very common and in most beautiful condition), and *Erebia evias*. This latter butterfly I found fairly plentiful wherever I went round Digne, its slow flopping flight making it appear to be an easy insect to catch, but it has an irritating way of flying along over some impossible bit of ground, just out of reach of the collector's net, where it seems to know it is perfectly safe. It was a good deal worn, and in bad condition, though the females were fresh; on the Dourbes, a week later, I found it quite fresh, and it must emerge a good fortnight later there than it does at Digne.

On the ridge of the hill behind Le Bleone, I found *Anthocharis tagis* var. *bellezina*. It was very local, indeed; in fact, I only took it in one place right at the top, and it was very far from common; of the six specimens I took, only three were fresh enough for the cabinet, and the others, being males, were released. Although there were several *Anthocharis belia* var. *ausonia* flying in the same place, I found no difficulty in distinguishing *bellezina* from them on the wing, their extremely small size alone rendering them unlike anything else. I found it a few days later—on the 16th, to be exact—much commoner about half a mile to the west of the little village of Villars, half-way up the Dourbes. Here I was able to take a short series of seven or eight specimens in good order, with two females, and should have got more only they flew very swiftly over an extremely bad bit of ground, where one's only chance of success was to stand still and intercept them as they flew quickly by. The females, which are considerably larger than the males, are much more difficult to distinguish from *ausonia*, not only when flying, but even when dead I find considerable difficulty in separating the two species to my satisfaction.

Far and away the best collecting-ground, when I was at Digne, was the Eaux Thermale Valley, and the little lateral valley which runs into it about half-way up. Here I found *E. argiades*, swarms of *P. bellargus* in all the glory of first emergence, together with a good many *P. corydon* and *P. hylas*, *Lycæna arion*, a few worn *P. baton*, *Thecla ilicis*, with ab. *æsculi* (very abundant after the 15th of June), *Colias edusa*, *C. hyale*, *Argynnus adippe*,

Brenthis euphrosyne, *Melitaea athalia*, *C. dorilis*, *C. alciphron* var. *gordius* (very fresh and fine), *Cenonympha arcania* (abundant and in the pink of condition), and a splendid black-banded form of *Melanargia galatea* var. *procida*.

(To be continued.)

SOME FURTHER NOTES ON THE DIURNI OF THE DEPARTMENT OF AISNE (FRANCE).

By W. G. SHELDON, F.E.S.

THE few days I had spent in the Forest of Villers Cotterets, which is situated in this Department, in 1906 (see 'Entomologist,' vol. xl. p. 75), made me wish for further acquaintance with the district, and learning from Monsieur Brown that the woods in the neighbourhood of Laon were good for certain species, including *Limenitis populi*, which I especially wanted, I journeyed thither on the 19th of June last, accompanied by Messrs. P. W. Abbott and E. F. S. Tylecote.

We stayed there until June 28th, and afterwards spent five days in the Forest of Villers Cotterets, returning to England on July 4th. The weather throughout was unpropitious there, as everywhere in Western Europe, with but little sun, and we were only favoured with two really good days.

With the exception that some species, including *Apatura iris* and a *ilia*, which we hoped to obtain during the last few days of our stay, did not appear at all, the season did not seem to be a late one; at any rate, not so much so as was the case in England, and a number of species were quite up to date.

Limenitis populi was not uncommon near Laon, where we obtained by hard work and much walking some fifty specimens during our stay; two examples were also netted at Villers Cotterets. The majority were var. *tremulae*, and intermediates between that variety and the type; of my series of sixteen specimens, three are typical, some half-dozen are var. *tremulae* or near it, and the remainder intermediates.

The habits of the imago much resemble those of the Apaturidæ; they are to be seen flying over the tree-tops at a height of thirty to forty feet, and they come down at intervals, in the roads running through the woods, settling on horse-droppings and moist spots, and on cold dull days they have a habit of settling on the dry white road, I think, for warmth.

The flight is much slower and heavier than that of the Apaturidæ, though they can fly fast when startled; they are very sluggish when settled on the ground, allowing the net to be placed over them, and in some cases to remain so for several seconds before they attempt to rise.

The only *Apatura* seen in any stage was a pupa of *A. ilia*, which I spied suspended from the under side of a leaf of *Populus tremula*, and which produced a male example of the var. *clytie* after my return to England.

Another interesting species observed was *Melitaea maturna*, which was not infrequent and in fair order, though a fortnight earlier would have been a better time for the majority of the specimens captured. *M. maturna* in this district frequents chiefly woods that have had the undergrowth cut a few years back; the flight very much resembles that of *Vanessa urtica*, which it is easy to mistake it for on the wing; it is very partial to settling on a bush, and from thence taking a short, rapid, hovering flight, returning to the same bush and twig and settling again.

In the marshes *Chrysophanus hippothoë* was in great numbers, and of both sexes, in the finest condition; the females were very variable, some of the examples being very brightly coppered, whilst others were almost black, with very little copper on the upper sides. Amongst my captures of this species was a male example without the principal row of ocelli which obtains in the type on the under sides of all wings. *Nomiades semiargus* was abundant in the marshes, and in the finest condition. *Melitaea aurinia* was also abundant in the marshes, but *passé*.

In the woods *Aporia crataegi* occurred plentifully, and examples of *Leucophasia sinapis* were observed; *Limenitis sibylla* was very abundant and fresh; *Melitaea athalia* and *M. dictynna* were common generally; *Pararge achine* flew abundantly in the shady rides; *Erebia medusa* was frequent, but almost all the specimens were past their best; *Thecla pruni* flew round bushes commonly; *Brenthis ino* was very abundant everywhere, and was in the finest condition, with plenty of females; *Cænonymphia arcania* flew freely by the sides of the rides; *Grapta c-album* was just emerging as we came away. *Thecla w-album* would doubtless have been abundant later on, but the only example actually observed was a pupa found by myself on the under side of an elm-leaf.

The larvae of *Vanessa urticae* and *V. io* swarmed on every patch of nettles. *Hesperia alveus* was frequent and freshly emerged. A newly emerged specimen of *Thecla ilicis* was taken, and one each of *Brenthis dia* and *Pararge mæra*. One small locality produced a few specimens of *Nomiades cyllarus* in fine condition.

Broods of *Vanessa polychloros* larvae had been abundant on poplar and elm, and a few late larvae were taken. The pupæ were to be found hung up under projecting copings of walls, &c.; and one found by Mr. Abbott attached to a grass-stem was at least one hundred yards from any possible food-plant.

The larvae of *Araschnia levana* were to be found on their food-

plant nettle not infrequently. The broods numbered from thirty to a hundred specimens each; the majority at the latter part of our stay were full-grown, but others were still very small. Those brought home pupated and emerged as var. *prorsa*, with a few var. *porima*, and intermediates, between July 20th and the end of the month; some, however, are remaining over, and will, I suppose, emerge next spring as the typical form.

From the examples bred I selected a dozen pairs, which I confined in a large gauze cage in the garden, introducing the food-plant and some flowers for them to feed upon. I observed two pairings, and eventually obtained seven batches of ova. The method of ova-depositing of this species is very unusual and interesting. The female affixes herself firmly to the leaf of a nettle—apparently without much preference as to which surface, for, of the seven batches of ova obtained, four were on the under side, and three on the upper side of the leaf; she then deposits an ova on the leaf. The ova are barrel-shaped and ribbed longitudinally; one end of the barrel is attached to the leaf. She next deposits another ova on the other barrel-shaped end of the first ova, and on this second ova another one, until there is a row of ova of from nine to twenty projecting from the leaf, approximately, at right angles from its surface. She then forms other rows, until the number of rows is from five to ten, and the number of ova in each batch from forty to one hundred. I cannot say whether the female deposits all her ova on one leaf, or if, after she has deposited one batch, she goes to a second or third leaf, but I am inclined to think the former is the case. The ova, when deposited, are bright green, but after a few days they turn dull yellow-green, and then a day or so before emergence black. The length of each ova is about half a millimetre, and thus the rows of ova vary from five to ten millimetres in length.

A few examples of the imago of the spring and typical form were flying in the woods at Laon in not bad condition, considering that they must have been on the wing some six or eight weeks.

NOTES ON *LYCÆNA ARGIADES*, PALL = *AMYNTAS*,
HÜBN.

BY THE HON. N. CHARLES ROTHSCHILD, M.A., F.L.S.

M. CHARLES OBERTHÜR published rather more than twelve months ago an interesting note on the above-mentioned insect,* which we translate in its entirety. The note reads as follows:—

* 'La Feuillée des Jeunes Naturalistes,' Quatrième Série, No. 429, p. 149, 1er Juillet, 1906.

"*Lycæna amyntas* and *coretas*. Two very distinct seasonal forms of *Lycæna amyntas* occur in Brittany. The spring form is smaller than the summer one. The female of the former has the wings on the upper surface more or less dusted with blue, whilst the upper surface of the wings of the female which emerges in the months of July and August is quite black, the hind wings having a small orange spot immediately above the tiny tail. In Brittany both the spring and summer forms have two or three small yellow marginal spots on the under side, which are more strongly marked in the summer race. Finally, in Brittany the two seasonal forms of *amyntas* present a striking peculiarity in respect to their habitats. In May this *Lycæna* occurs in the meadows and grass rides in the woods, while in July it is practically confined to the heaths where the heather is high. I am inclined to consider that the two seasonal forms of *amyntas* occur in the whole of the west and south-west of France as they do in Brittany.

"In the Eastern Pyrenees, where we have collected more than sixty specimens, some in the spring and some in the summer, the female is invariably black above, without the orange marginal spot on the hind wings. Both sexes, moreover, lack the yellow marginal spots on the under side. As in Brittany, the summer is generally larger than the spring form, and sometimes the tail of the hind wings is wanting. This is the *Lycæna coretas* of Ochsenheimer and Gerhard. I am inclined to think that *coretas* is a distinct species from *amyntas*. I have specimens of both *amyntas* and *coretas* from the Basses Alpes. In the neighbourhood of Digne these two *Lycænas* are found in the same localities, but in the Eastern Pyrenees (Villefranche-de-Conflet and Vernet-les-Bains) and in the neighbourhood of Rennes they seem to inhabit different localities.

"*Amyntas* is distributed over Manchuria, China (Chang-Hai), and in Japan. *Coretas*, however, has not been found in Asia.

"From Yunnan I possess a new variety (or possibly species) of which the male has broad black margins to the fore wings.

"In France it would be interesting to record the localities where *amyntas* and *coretas* occur together and separately. I appeal to the kindness of the readers of 'La Feuille' to inform us on this point.

"Hübner has figured under the numbers 319, 320, and 321, under the name of *tiresias*, *coretas* of Ochsenheimer and Gerhard.

"The same author has figured *amyntas* forma *æstivalis* under the numbers 322, 323, and 324."

The names used in the above article are not those of the last edition of Staudinger and Rebel's 'Catalogue,' in which work *tiresias* of Hübner is given as a synonym of *polysperchon*, Berg. If this view be correct, *tiresias* must be a name for the form with the yellow marginal spots on the under side, the spring generation of *argiades* = *amyntas*, and not of *coretas* of Ochsenheimer.

Mr. Oberthür refers to two most interesting but quite different points, the first being that the spring and summer broods of *argiades* = *amyntas* occur in quite different localities; and the second, that *argiades* = *amyntas* is a distinct species from *coretas*. The occurrence of the two broods of the same species of butter-

fly in quite different localities seems worthy of further investigation, and I should be interested to know to which form the few known British examples of *L. argiades* belong, and also if these examples can be referred to *argiades* proper or to *coretas*.

CURRENT NOTES (NEW SERIES).

By G. W. KIRKALDY.

1. AINSLIE, C. N.: "Notes on the Swarming of a Species of Cranefly," Can. Ent. xxxix. 26-8 (January 12th, 1907). Diptera.
2. BANKS, N.: "A Revision of the Tyroglyphidæ of the United States," Bull. U. S. Ent., techn. ser. 13, pp. 1-34, pls. i.-vi. (November 14th, 1906). Arachnida.
3. COBB, N. A.: "Fungus Maladies of the Sugar Cane, with Notes on Associated Insects and Nematodes," Bull. H. S. P. A., Pathol., v. 1-208, figs. 1-99, pls. i.-vi. [including Report by L. Lewton-Brain] (November, 1906). Diptera, Coleoptera.
4. DAVIS, W. T.: "Insects as the Food of Squirrels," Can. Ent. xxxix. 16 (January 12th, 1907).
5. DYAR, H. G., and KNAB, F.: "The Larvæ of Culicidæ classified as Independent Organisms," J. N. York E. S. xiv. 169-230 (December, 1906). Diptera.
6. ESCHERICK, K.: "Beiträge zur Kenntniss der Thysanuren, ii." Zool. Anz. xxx. 737-49, figs. 1-5 (October 16th, 1906).
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27. SMITH, A. E.: "Note on Stereo-photo-micrography," J. Quekett Micr. Club (2), ix. 429-30, figs. 1-2, plates 31-3 (November, 1906).
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33. WILLISTON, S. W.: "Some Common Errors in the Nomenclature of the Dipterous Wing," *Psyche*, xiii. 154-7, fig. (December, 1906).

34. Id.: "The Classification of the Culicidæ," Can. Ent. xxxviii. 384-8 (December 10th, 1906). Diptera.

35. WILSON, J.: "Report of the [U. S. A.] Secretary of Agriculture, 1906," 1-112 (1906).

36. XAMBEU, —: "Mœurs et Metamorphoses des espèces du Genre *Silpha*," Le Nat. xxviii. 264-6 and 277-9 (November 15th and December 1st, 1906). Coleoptera.

37. [anon]: "An Abstract of Bulletin No. 30, about some Injurious Insects," Imp. Agr. Exp. Sta. in Japan, pp. 1-11 (March, 1904). Hemiptera, Diptera, Coleoptera, Lepidoptera, Hymenoptera.

38. 'Experiment Station Record.' xviii. Nos. 1-4, containing pp. 1-400 (September-December, 1906).

The U. S. Experiment Station Record (38) has entered upon its eighteenth volume. It is issued monthly, and includes brief summaries of the papers on economic entomology published throughout the world.

The 'Bericht der Entomologie' for 1901 has now been completed (13). Though greatly delayed, it is treated in great deal, occupying 1584 pages as against 374 in the 'Zoological Record' for that year.

The Report of the United States Secretary of Agriculture (35) deals with entomology on pp. 70-7, and especially with the introduction of beneficial insects. The systematic introduction from Europe of parasites to cope with the Gypsy Moth and Browntail Moth has been at last started, and success has apparently attended the initial efforts.

The thirtieth bulletin of the Japanese Imperial Agricultural Station was written entirely in Japanese, but a summary in English has been issued. Eleven coloured plates of metamorphoses accompanied the original. The following insects were discussed:—

1. *Enaria lewisi*, Scott, pl. i., a Cimicid bug which damages rice.

2. *Tipula parva*, Löw, pl. ii., a dipteron whose larvæ destroy the seed-grains of the rice plant by gnawing the young plants just below the surface of the soil.

3. *Jathesia chrysographella*, Moore, pl. iii., a lepidopteron injurious to rice.

4. *Nematus* sp., pl. iv., a sawfly injurious to pear-trees.

5. *Apriona rugicollis*, Chevr., pl. v., a beetle-pest of the mulberry.

6. *Diaspis patelliformis*, Sasaki, pl. vi., a Coccid pest of the same.

7. *Portesia auriflua*, Hübn., pl. vii.

8. *Hemerophila atrilineata*, Butler, pl. viii.

9. *Zamacra albofasciaria*, Leech, pl. ix.; the last three being lepidopterous pests of the mulberry.

10. *Ophalmodes cretacæ*, Butl., pl. x.a, a lepidopterous (Geometer) pest of tea.

11. *Tetigonia guttigera*, Uhler, pl. x.b.

12. *T. ferruginea* (Fabr.), pl. xi., leaf-hopper pests of pine and mulberry respectively.

Scourfield's summary of Mendelism and its relation to Microscopy (25), and Smith's notes on Stereo-photo-micrography (27) will be interesting to many entomologists.

Perkins summarizes (16) the insects of a mountain summit, with its subordinate peaks, near Honolulu, the collecting-ground most accessible to that city. All the orders are discussed, with notes on the habits of many species, and remarks on the changes in the locality during the past fifteen years. The same author details (17) a new method of relaxing and cleaning insects, boiling water, soap, and naphthaline constituting the ingredients of the new formula.

Preissecker discusses the enemies of tobacco in Dalmatia (20), including *Agrotis* spp., the plant-louse (*Myzus plantagineus*), and Orthoptera, Thysanoptera, and Coleoptera. Davis writes on insects as the food of squirrels (4).

Peyerimhoff has published two interesting notices on cave-entomology (18 and 19). The caves are in the neighbourhood of Digne, in the department of Basses-Alpes.

Cobb's report on fungus maladies of the sugar-cane (3) contains extended notices on Diptera and Coleoptera connected with the dissemination of fungus spores. It is proved that *Ithyphallus* spores are spread in the excreta of Diptera, and digestion in this order is discussed at length, together with the power of flight, vision, &c. There is also a short note on the relation of the Nitidulid beetle *Carpophilus* sp. to the "Pine-apple Disease of Sugar Cane" (*Thielaviopsis*). Altogether forty pages and six figures are specially devoted to insects.

Escherich makes further contributions to a study of the Thysanura (6). Terry notes that the method of increase of the

antennal segments in the instars of a Hawaiian earwig is not the same as in the common British form (30); the data in the latter case are, however, fragmentary and apparently inaccurate. Siltala discusses the parasites of Trichoptera (26).

Oshanin has commenced (15) a catalogue, with references, synonymy, &c., of the palæarctic Hemiptera, including Japan, &c. The first part of the first volume deals with Cimicidæ, Lygæidæ, Pyrrhocoridæ, Geocoridæ; the first part of the second with the Cicadoidea. For these groups Oshanin records 1335 and 784 species respectively. Puton in 1889 admitted 1011 and 730, but he excluded China and Japan.

Kirkaldy summarizes (11) Reuter's recent classification of the Miridæ, and translates the analytical key of the divisions, as well as making numerous additions and corrections to his own recent nomenclatorial paper on the Hemiptera.

Marlatt has brought Bulletin 12 of the same series up to date (14), discussing the Coccid *Aspidiotus perniciosus*.

Fuller remarks on the supposed poisonous properties of "bagworms" (Psychidæ) (7). Schultz discusses certain palæarctic gynandromorphous Macro-Lepidoptera (23). Willem makes an observation additional to the recent ones of Plateau on *Macroglossa* (32). Swezey details the life-history in Hawaii (29) of *Plusia chalcites*, *Spodoptera exigua*, and *S. mauritia*; as the second is found in the British Isles his paper will be of interest to British lepidopterists.

Schuster deals biologically (24) with several species of *Crioceris*, and Xambeu (36) with *Silpha*. Gaulle has commenced (8) a systematic and biological catalogue of French Hymenoptera.

White describes certain bee-diseases (31). Girault details the oviposition of the Chalcidid *Trichogramma* (or *Chætostricha*) *pretiosa*, parasitic on the sawfly *Pteronotus* (or *Nematus*) *ribesii*. The sawfly is common to Europe and North America, but the parasite has only been recorded from the latter so far, though other species of the genus are European (9). Riley briefly summarises (22) Silvestri's recent biologic work on *Litomastix*.

Williston criticizes the methods of certain recent workers on Culicids (34), and corrects some common errors in the nomenclature of the dipterous wing (33). Dyar and Knab (5) describe a large number of Culicid larvæ, many being treated as new species independently of the adults. In an editorial, Dyar declares (p. 231) that the date of this paper is March 14th, 1906, authors' *separata* having been distributed on that date. The correct date, however, is December, the journal having been issued apparently during that month. Gossard and Houser bring forward some fresh facts relative to the life-history of the Hessian Fly (10). Ainslie has some notes on the swarming of the Tipulid *Trichocera bimacula* (!). Riley mentions the case of larvæ of a *Sarcophaga* in a tumour in the back of a woman (21). Lécaillon reviews

existing literature on the metamorphoses of Tabanidæ, and details those of *Tabanus quadrinotatus* (12).

Banks's revision of the Tyroglyphidæ (2) is a valuable contribution to the knowledge of the difficult "cheese-mites" and "sugar-mites." Soar deals with the relation of Hydrachnids (28) to their parasitism on aquatic insects.

NOTES ON THE GENUS *EUPITHECIA*.

By LOUIS B. PROUT, F.E.S.

(Continued from p. 175.)

ANOTHER question raised by Mr. Dadd in the same place (Ent. Rec. xviii. 259) concerned the *innotata* group (*innotata*, Hfn., *fraxinata*, Crewe, and *tamarisciata*, Frr.), and although I do not know that I have any fresh light to throw on these, a survey of what is known may prove helpful. Mr. Tutt (*loc. cit.*) rightly girded at the German entomologists for undiscriminatingly using "var. *fraxinata*, Crewe," for the second generation of *innotata*, Hfn., whereas in Britain *fraxinata* is single-brooded, hibernating as a pupa; but the question of possible specific identity cannot be summarily dismissed on this ground. It has been definitely ascertained that larvæ from the early brood of *innotata* will feed on ash and other leaves (see below, and compare the case of *E. virgaureata*, to be discussed later), and it has also been ascertained that there is occasionally a second brood of *fraxinata* in England, and that the larvæ obtained from this will accept mugwort as a food-plant (*vide* Crewe in Ent. Annual, 1865, pp. 124-5). It is therefore not inconceivable that the regular economy further south than with us is to alternate, according to the season, between the flower-feeding and tree-feeding habit, but that in Britain, being practically driven into single-broodedness, it has split up (or is in course of doing so) into two races, one favouring each pabulum. It seems to me that ash-feeding summer larvæ, if deprived by climatic conditions of the autumnal emergence of their imagines, would concurrently be deprived of the later autumn mugwort larvæ, and an ash-feeding race could be established; while a belated emergence from hibernated pupæ (say, about Midsummer instead of in April and May, as in Germany) might at the same time bridge over the period in which a tree-feeding habit would have been necessary, and result in the laying of eggs on *Artemisia*, &c., which might by that time be sufficiently advanced to be serviceable. I know that all this is highly speculative, and that even if it be in accordance with fact it does not absolutely settle the question whether it were more expedient

to treat the forms (in Britain) as one species or as two; although, for my own part, I consider that two forms co-existing within the same area and maintaining separate life-cycles are better called "species," and may, in the absence of evidence to the contrary, be assumed to have passed beyond the stage of inter-crossing. We must not forget, moreover, that the descriptions given by Crewe and Westwood (Ent. Ann. 1863, pp. 116-121) indicate wide larval divergence, although the German *innotata* larva is also excessively variable. A good summary of the descriptions and the literature will be found in Hofmann's 'Raupen,' edition 1893, pp. 265-6. Rössler was the first to record finding the larva of *innotata* on sloe (Wien. Ent. Monats. viii. 131), and in 'Die Schuppenflügler' (p. 195) he gave a longish note summarizing what was then (1881) known in Germany of larval food-plants, times of year, &c., and concluding that *fraxinata* (bred in June or later from larvæ occurring in June on ash, sloe, whitethorn, mountain ash, flowers of dog-rose, &c.) was the second brood of *innotata*, and *tamarisciata*, Frr. (on *Myricaria germanica* and *Tamarix gallica*), a dark southern form of the same. Bohatsch followed (Wien. Ent. Zeit. i. 163) with a note supporting the same contention, and recording the breeding of the *fraxinata* form in August (as a second brood) from larvæ on buckthorn and oak; and in the same periodical (iii. 296) he recorded that Habich had bred, between July 15th and August 15th, this same *second brood* form from part of a batch of hibernated pupæ of which the rest had emerged normally in the spring as typical *innotata*. Habich himself confirmed this some years later (Stett. Ent. Zeit. liii. 159), and added the record of a further experiment; he obtained a pairing of bred *innotata* in the early spring, fed the larvæ on rose leaves, and got them full fed by the end of April, the imagines appearing irregularly through the months of May, June, July, and August, nearly half of the total number in the last month. They were smaller and lighter than typical *innotata*, and their larvæ were somewhat more slender, and in a few cases almost unicolorous green.

In the meantime Dietze made some observations on the different larval races of what he considered *E. fraxinata* (Stett. Ent. Zeit. xxxiii. 197-9, xxxvi. 69-70), from which we learn that he found no considerable differences between the *Prunus* larvæ and those of the ash, but that there was a difference between the eggs, both of which he describes (xxxvi. p. 70); he points out, however, that he only had six freshly laid eggs of the ash race to compare, and that the differences may have been peculiar to the individual brood. Imagines reared from ash laid their eggs both on ash and hawthorn, and I gather that the larvæ (second brood, August) accepted both, but their further history is not traced. Dietze regards both forms as definitely double-brooded, and

makes no reference to any offer of *Artemisia* to the later brood of larvæ.

Stange (Stett. Ent. Zeit. xlvi. 281) also records some personal experiences of *innotata*, of which he bred a few *ex ovo* on *Artemisia vulgaris*, which hibernated as pupæ, and one from a beaten larva from rose, which emerged on August 4th the same year. He inclines to the view of Rössler "and Speyer" (*ubi?*) that all three of the group are modifications of one species.

Millière (Ann. Soc. Lyon xix. 30, 31) has brief notes on all the three larvæ of the group; he treats *tamarisciata* as a valid species (larva uniform light green, on *Myricaria germanica*, and not varying), "fraxinata of the English" (which he found in June, 1863, on *Coriaria myrtifolia*) as well removed from *innotata* by the form and colour of the larva (green, excepting the vinous anal flap), but perhaps only a variety of *tamarisciata*.

The British form of *innotata* larva is described by Hellins (Ent. Mo. Mag. xxi. 187) under the title of "an enigma," the solution being given later in notes by Warren and by Hellins himself (Ent. Mo. Mag. xxii. 257, xxiii. 115, xxiv. 10); Hellins' notes, with a later description by Buckler, are given in full in Buckler's 'Larvæ,' viii. 35, and a figure added, pl. 136, fig. 6. The usual British form seems exceedingly different from the gay green, red-marked form which is prevalent in Germany, Southern France, &c.; but Warren says his British examples were variable, and I have already mentioned that the Continental are extremely so. The one or two larvæ I have myself found (at Sandown, on *Artemisia vulgaris*) agreed, so far as I can recollect, with Hellins' description and Buckler's figure. Barrett records (Lep. Brit. ix. 105) that Mr. Robson, of Hartlepool, has found and reared *E. fraxinata* on flowers of scabious; probably Mr. Robson knew the larva, otherwise one would be inclined to refer the record to *innotata*, as both occur at Hartlepool.

Dr. Draudt, in describing the eggs of *E. innotata* ('Iris,' xviii. 315, pl. vii., fig. 4), says that that of "var. *fraxinata*, Crewe," is entirely like it, and that the same can probably be said of "var. *tamarisciata*, Frr." Perhaps the genitalia will throw some further light on the subject. Schröder's elaborate description and figure of the apparatus in *innotata* (Ill. Zeit. Ent. v. 305) is purely anatomical, and does not deal with the allied forms.

III.—DENOTATA, VIRGAUREATA, &c.

A pair of species whose probable specific identity has hardly been at all discussed are *E. denotata*, Hb. (*campanulata*, H.-S.), and *jasioneata*, Crewe. The British forms look so very distinct in the imago state that, although Crewe noticed the great similarity of the larvæ, and the botanical relationship of the

food-plants, he does not seem to have thought it possible that the two might be co-specific. Probably Crewe was not acquainted with the dark mountain var. (ab.) of *denotata* known as *atraria*, H.-S. = *ferreata*, Fuchs (J. B. Nass. Ver. Nat. liv. 57), which Herr Püngeler tells me is certainly co-specific with the typical form, all intermediates occurring among bred specimens (*in litt.* November 29th, 1905), while it is practically indistinguishable from some of the lighter specimens of *jasioneata*. Rössler and Fuchs, it is true, regarded Herrich-Schaffer's *atraria* as representing a dark form of *castigata*, Hb., hence Fuchs's new name for that of *denotata*; but even if they were right, this would not affect the connection established by the last-named between *denotata* and *jasioneata*.

That *E. denotata* is not confined to *Campanula trachelium* is clear not only from Crewe's record (Ent. Mo. Mag. vii. 143) of finding larvæ in his garden on nine other species of *Campanula* and on *Phyteuma*, but also from several Continental writers. Püngeler finds the larvæ of var. *atraria*, H.-S., at Pontresina, &c., on *Campanula barbata*, and my correspondents, Herr Dietze and Dr. Draudt, tell me that, last autumn, larvæ entirely agreeing with those of this species and of *jasioneata* were found at Oberstdorf (Bavaria) on *Phyteuma spicatum*. Nor is this all; if *primulata*, Mill., is, as it has been determined, really = var. *atraria*, H.-S., *Primula latifolia* must be added to the list, whilst, if Fuchs's *denotata* and ab. *solidaginis* (J. B. Nass. Ver. Nat. lv. 78) are rightly placed by that author, it has also taken, exceptionally, to *Solidago virgaurea* in a state of nature, unless his son somehow mixed the larvæ he collected.

Last September I had a large number of larvæ of *E. jasioneata*, collected in North Cornwall, and several of *E. denotata*, from Dorking. Both were variable, though less excessively so than many of the "pugs," but I absolutely failed to find any difference between the two. The pupæ, which are now before me, are also identical. The *E. jasioneata* are already emerging (early June), and I believe this is naturally a somewhat earlier form to appear than *denotata*. In this respect, as Herr Dietze remarks, the Oberstdorf form occurring on *Phyteuma*, and already mentioned above, should belong to the former, for the *Campanula* larvæ were not yet findable when these were taken last August. I have not yet heard from my friends what form of imago resulted from the *Phyteuma* larvæ.

Herr Petersen, of Reval, had a male of each of the supposed species from me a few years ago, and examined the genitalia; he believed he had found differences sufficient to warrant keeping them distinct, and intended to send a note on the subject to one of our British magazines. On the other hand, Mr. Pierce, of Liverpool, writes of *jasioneata* which I sent him: "There is

little doubt it is only *campanulata*, at any rate so far I can see no difference" [i.e., in the male genitalia].

The larvæ of both forms thrive on remarkably dry seeds, and individuals go on feeding far into the autumn. I myself had them both going on healthily up to the beginning of November, but my friend, Mr. John Peed, caps this with a record of *denotata* (*campanulata*) still feeding on 15th December last year!

Eupithecia virgaureata is another very interesting species, particularly as regards its economy. As Mr. Percy Reid raised the question of the food-plant and date of the first-brood larvæ (Ent. Rec. xix. 22), I imagine Klos's note (Verh. Z. B. Ges. Wien. li. 785) is not very generally known to British entomologists. He records that at Stainz, near Gratz, he found on whitethorn and blackthorn, between 24th June and 5th July, 1901, some thirty larvæ which at once reminded him, in their scheme of markings, of *E. virgaureata*, although they were darker, being of a chestnut brown colour. To his surprise, the moths emerged, from 29th July to 30th August, veritable *virgaureata*, though much smaller than the type and of a darker ash-grey shade, with the spots bounding the central area well pronounced and united into a band. He had not previously found the species on any plant but *Solidago virgaurea* and *S. canadensis*, on which it was abundant in his district; he had never found it on gentians or umbellifers, sometimes given as food-plants, the larvæ which he found on *Gentiana asclepiadea* always producing *castigata*. He is unaware whether there is ordinarily a second brood; in his district it appears, in a state of nature, at the end of March if mild, or in mid-April if cold—not in May and June, as given by other observers.

There are some other curious records of food-plants for this species, and some of them may safely be accepted as authentic, though it is possible that one or two rest on a mis-identification of the closely allied, variable, and polyphagous *E. castigata*. I do not call the flowers of *Senecio* a "curious record" for it, as they are allied to the golden rod; Crewe found it thrive well in captivity on *Senecio* (Ent. Ann. 1861, p. 135—under the old, erroneous name of *pimpinellata*—and 1863, p. 127); Hellins found this the favourite natural food-plant in Devon (Ent. Ann. 1862, p. 47); and, if I remember aright, Mr. G. F. Porritt has told me that it also inhabits ragwort on some of our coast sand-hills. In the 'Zoologist' for 1862, p. 8208, it is recorded on the same plant both in Devon and at Albury (Surrey), and there are doubtless other such records scattered throughout our magazines. More remarkable, but no doubt reliable, on account of the authority on which it is given, is the "on flowers of ling" of Buckler's 'Larvæ' (viii., expl. of pl. cxxxii.); and I fancy that "millefoil," given by Barrett, is also taken from the work of one of our old English masters. The gentian and umbellifer records

mentioned by Klos originate with Bohatsch (or ? Schieferer), and are from Klos's own district, Gratz ; Bohatsch ('Iris,' vi. 4) writes that there, though no doubt it occurs on *Solidago*, yet it is "much commoner on *Heracleum sphondylium* and *Gentiana*." He points out (*ibid.*, p. 3) that the male moth can be separated from its allies by the fascicles of cilia of the antenna. Gregson (Proc. North. Ent. Soc., 27th June, 1863, p. 16) reports Greening to have reared fine imagines on leaves of sallow, also (Zool. xx. 7902) to have bred it from seed-heads of *Lychnis dioica* (!), but I will not guarantee that he did not confuse his species.

That there is a second brood has long been accepted in England ; it was recorded (though only for a state of captivity) by Crewe in the Ent. Annual, 1863, p. 126. It will probably be remembered that from May ova he raised a brood which fed up with great rapidity on flowers of cow-parsley (*Anthriscus sylvestris*), had all pupated by the end of June, and produced imagines from the end of July to the beginning of August. Like those reared by Klos, these were smaller and darker than the first brood.

(To be continued.)

NOTES AND OBSERVATIONS.

TORTRIX PRONUBANA, Hb., AT CHISWICK.—On July 18th, while beating in the garden here about 6.30 p.m., I disturbed, from a vine on the wall, a bright orange little moth. It flew very actively, and escaped once out of the net before I was able to box it. From the colour of the hind wings I suspected it to be *Tortrix pronubana*, Hb. The moth was exhibited at the meeting of the South London Society on the 25th inst., when both Mr. Adkin and Mr. South saw it. Below the vine is a bush of *Euonymus japonica*, in which *Capua angustiorana* and other Tortrices occur.—ALFRED SICH ; Corney House, Chiswick, Middlesex, July 29th, 1907.

PORTHESSIA CHRYSORHCEA.—Reading Mr. H. Rowland-Brown's note (*ante*, p. 186), in which he asks "if the migrants of subsequent generations have established themselves in or near the old haunt of the Lower Sandgate Road, Folkestone," reminds me that the only ones I have ever taken were in the drawing-room of Castle Glen, Lower Sandgate Road, to light, two on July 30th, and one on August 6th, 1899. All three were females.—JOSEPH F. GREEN ; Taverham Hall, Norwich, August 17th, 1907.

ON THE REARING OF PAPILIO PODALIRIUS.—I would be very glad to hear from any reader of the 'Entomologist' who has successfully reared *P. podalirius*. I have tried and have failed, and I want to discover if possible why I failed. This last spring, while on a visit to the South of France, I collected a good many ova off young almond trees ; these successfully hatched, but several of the young larvæ died from some cause or other, and when I arrived home early in May I

counted about twenty-five. These I fed on peach, and kept them in a cool greenhouse, where they appeared to do well, and in the end seventeen pupated between June 20th and 30th; but most of the pupæ—which, by the way, were of fine size—appeared to be deformed, the cases for the antennæ looking like crumpled horns. They emerged between July 22nd and August 5th, but not one of them was fit for the cabinet, all being deformed in some way or other. I should like to add that I have brought through a beautiful series of *G. cleopatra* from ova collected at the same time, and they were lodged in the same house as the *P. podalirius*, and it is curious that I should have succeeded in the one case and failed in the other.

EMERGENCE OF *NUMERIA PULVERARIA* IN JULY AND AUGUST.—In sending me some larvæ of this species in early July last, Mr. F. Pope, of Exeter, suggested that the moths would be reared this year. I rather doubted this, and wrote to him to this effect. In his reply he stated that from eggs deposited by females captured on May 30th last year, the larva fed up quickly on sallow, and by July 28th sixteen moths had appeared. Well, last summer was a favourable one for second generations in species that are normally only single-brooded with us, but one would hardly expect such kind of thing this year. I was therefore agreeably surprised when on August 16th a male *N. pulveraria* emerged. At that date the majority of the larvæ had gone down, but five were still feeding, although apparently full-grown, and two of these continued to do so until the 22nd of the month.—RICHARD SOUTH.

SCARCE HAWK-MOTHS IN KEW GARDENS.—Two imagines of *Deilephila euphorbiae* have been bred from pupæ found under an oak tree in the Queen's Cottage grounds, Kew, on March 2nd, 1907, by Messrs. G. Nicholson and A. L. Simmons. The pupæ were quite close to the surface, about nine inches from the trunk facing north-east, and were in earth-cocoons. Mixed with the earth were small portions of spun silk and minute fragments of leaves. The moths emerged on June 10th and 21st respectively. There are no euphorbias in the immediate neighbourhood where the pupæ were found, consequently we must conclude that they fed up on some other plant. Up to August 5th of this year neither imago nor larva has been found. Tutt, in *Brit. Lep.* vol. iv. p. 235, mentions various other food-plants in addition to the euphorbias—fuchsia, vine-leaves, lettuce, *Polygonum aviculare*, oak, and perhaps *Plantago lanceolata* and dandelion. Messrs. Nicholson and Simmons also found a pupa of *Sphinx pinastri* in the Gardens, but it failed to produce an imago.—W. J. LUCAS.

CAPTURES AND FIELD REPORTS.

ZEPHYRUS QUERCUS ab. *BELLA*.—Referring to p. 141 of 'Butterflies of the British Isles,' I beg to inform you that on August 11th last I saw and captured, near Dorking, a female *Zephyrus quercus* ab. *bella* (Gerh.). The specimen is slightly undersized.—EDWARD R. GOFFE; 46, Vardens Road, Wandsworth Common, August 12th, 1907.

SESIAS ANDRENIFORMIS.—In my note on breeding this species (*ante*, p. 189), I find that I wrote "dogwood" instead of *Viburnum lantana*.—J. OVENDEN.

MYELOPHILA (MYELOIS) CIBRUM (CIBRELLA) IN SURREY.—So far as I am aware this species has not been noted as occurring in Surrey. I may therefore record the capture, in the garden here, of a very fine specimen on July 14th last. During the following evening Mr. Norman Riley, who resides next door, captured a specimen that entered an upper room, no doubt attracted by the bright light therein. The example taken by myself, I may add, was disturbed from a row of sweet peas. Possibly this species has a wider distribution than it would seem to have from records of its capture. Perhaps it may often be passed over as *Hyponomeuta cognatellus*.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

PLUSIA MONETA IN THE NEW FOREST.—Contrary to the expectations of some entomologists, this species has undoubtedly established itself in our midst, as it is seventeen or eighteen years ago since it was first taken this side of the Channel. My nephew—Mr. F. V. Brown, of Ashby-de-la-Zouch—having come for a week's collecting in the Forest, I accompanied him thither, and, although unable to do any practical work myself, I saw a number of *P. moneta* dashing about in the dusk on July 14th, and managed to capture two fine specimens. On the following evening another specimen was taken, but I did not see so many as on the previous date. On searching the garden for its food-plant, I could find but one poor stalk of monkshood, a close scrutiny of which revealed no indications whatever of the larvæ having fed thereon, or of ova being deposited. I am not sure if this is the first record of the species from the Forest, but I may mention that last season I knew of one specimen taken at rest on a tree-trunk, and another came to light near Ringwood. In 1899 the insect is said to have been taken in Wiltshire at sugar, which seems rather a departure from the usual habits of its class, as I do not recollect ever taking any of the genus at the sweetened allurement, but that is no reason why others have not had a different experience.—G. B. CORBIN; Ringwood.

A DAY'S DRAGONFLY COLLECTING AT THE BASINGSTOKE CANAL.—On June 23rd last we went to Byfleet, for the purpose of collecting from the Basingstoke Canal certain species of *Agrioninae* which do not appear to occur in the Epping Forest district. The following are a few observations upon the most interesting specimens:—(1.) *Erythromma naias*.—A male was obtained having the right mid-leg in a very rudimentary condition. (2.) *Ischnura elegans*.—Two females of var. *infuscans* were taken, one of them *in cop.* (3.) *Agrion pulchellum*.—In one male, the neck joining the U-shaped spot on segment two with the circlet behind was reduced to a mere thread, and the marking closely resembled that seen in *A. puella* mentioned below. (4.) *A. puella*.—A male had the U-shaped spot on segment two connected with the circlet. (5.) *Enallagma cyathigerum*.—We had the satisfaction of witnessing for ourselves a proceeding connected with oviposition which had been previously recorded of this species, but which seemed difficult of belief. What happened was this: A pair of *Agrionines*, attached

per collum, were noticed flying close to the surface of the water of the canal. Presently they, or at all events the female, alighted upon a tangle of floating grass and sphagnum moss, and, having been liberated by her partner, she deliberately entered the water, and disappeared from view. The male, presumably for the purpose of assisting the female from the water upon her return to the surface, continued to hover over the site; he was taken, and the species determined as *E. cyathigerum*. In the space of two or three minutes after disappearance, the female was again seen clinging to the under side of the floating vegetable matter. She then quickly climbed up to the upper side, and seemingly prepared herself for flight. The grass was drawn to the bank and the insect secured; she dried off very rapidly, and appeared to be none the worse for her adventure. The impression conveyed by her movements in the water was that during the period of immersion she had descended to a considerable depth.—F. W. & H. CAMPION; 33, Maude Terrace, Walthamstow, Essex.

SHORT LIST OF LEPIDOPTERA COLLECTED NEAR GIBRALTAR IN MARCH AND APRIL, 1907.—I am sending this list in the hope that it may be of use to readers of the 'Entomologist' stationed in the Army or Navy, at Gibraltar:—*Papilio podalirius* and *P. machaon*, common in the hills round the Cork Wood; *Thaïs rumina*, common in the Cork Wood; *T. polyxena*, several in the Cork Wood; *Aporia crataegi*, one specimen in the Cork Wood; *Pieris brassicae*, *P. rapæ*, and *P. napi*, common; *Pontia daplidice*, *Leucophasia sinapis* and g. v. *lathyri*, *Euchloë euphenooides*, and *Colias edusa*, common in the Cork Wood; *Gonepteryx rhamni*, several in the Cork Wood; *G. cleopatra*, abundant in the Cork Wood and on the Rock; *Pyrameis cardui* and *Vanessa urticæ*, not common; *V. antiopa*, one, in the Cork Wood; *Melitæa didyma*, two, in the Cork Wood; *Melanargia lachesis*, one male, Benaogan; *M. syllius*, one male, Gaucin; *Erebia tyndarus*, two males, Queen of Spain's Chair; *Satyrus circe*, one near Banaocaz, about 3000 feet elevation; *S. briseis*, one, Campamento Plain, several at Gaucin; *S. arethusa*, one male, in the Cork Wood; *S. statilinus*, several in the Cork Wood; *Pararge megæra*, *Epinephele ianira*, and *E. hyperanthus*, very common; *Thecla rubi*, abundant in the woods near Gaucin; *T. spinæ*, one, in the woods near Gaucin; *Thestor ballus*, one, in the Cork Wood; *Chrysophanus virgaureæ*, fairly numerous; *C. phœas*, very common; *Lampides boeticus*, *Lycæna icarus*, *L. hylas* (baton), and *L. orion* (battus), common in parts of the Cork Wood; *Deilephila euphorbiæ*, one, blown on board, from Gibraltar; *Charocampa celerio*, one, at arc lamp in Gibraltar Dockyard; *Daphnis nerii*, one, near the Signal Station, Gibraltar; *Macroglossa stellatarum*, very common; *Zygæna sarpedon*, one, Benaogan; *Aglaope pruni*, several on hills round Gaucin; *Lithosia lutarella*, two, in the Cork Wood; *Arctia hebe*, one, Benaogan; *A. cæia*, common; *Oreopsyché atra* (plumifera), one, in the woods near Gaucin; *Saturnia pyri*, a few larvae near Gaucin; *Cnethocampa processionea*, larvae numerous in second pine wood; *Cerura vinula*, one, at lamp, on board, in Gibraltar; *Uropus ulmi*, at arc lamp, in Gibraltar Dockyard; *Agrotis c-nigrum*, several, at arc lamp, in Gibraltar Dockyard; *Deiopeia pulchella*, several, near Banaocaz, about 2500 feet elevation.—F. W. SOWERBY, R.N., H.M.S. 'Russell,' Atlantic Fleet, July 7th, 1907.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 11th.*—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Waterer, Brockley, was elected a member.—Mr. Rayward exhibited fine bred specimens of *Agriades bellargus* and *Polyommatus icarus*, and commented upon their size and brilliancy, in spite of the fact that ants were almost constantly in attendance upon the larvæ.—Mr. H. Moore, specimens of *Euchelia jacobææ* from the Dunkirk sand-dunes, one of which was exceedingly pale, and a cricket from Lisbon.—Mr. Gibb, the "Simplex" net, frame, and stick.—Mr. Sich, cocoons of *Cedestis farinatella*, a lepidopteron whose larva lives in the needles of Scotch fir.—Mr. Newman (1) a gynandromorphous specimen of *Amorpha populi*; (2) bred series of *Melitaea aurinia* from Kent and Ireland; (3) a bred series of *M. cinxia*; (4) a *Smerinthus ocellata* with extreme development of the pink colour of the fore wings; (5) bred specimens of *Dicranura bicuspis* from Tilgate; (6) a selection of under sides of *Polyommatus icarus* from North Kent; (7) pupæ and full-grown larvæ of *Argynnis paphia* and *A. adippe*; (8) living larvæ of *Agriades corydon*; (9) bred specimens of *Cucullia gnaphalii*; and (10) very fine and extremely varied series of *Boarmia repandata* from Leigh Woods, Torquay, Epsom, and North Kent, including some extreme var. *conversaria* and melanic forms.—*Hy. J. TURNER, Hon. Rep. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*June 4th, 1907.*—Mr. O. E. Janson, of Highgate, was elected a member of the Society.—Rev. C. R. N. Burrows exhibited *Ennomos quercinaria*, including ab. *equestraria*, from Ipswich.—Mr. J. A. Clark, a cabinet drawer of "Thorns," including a very variable series of *E. quercinaria*, in which ab. *carpinata*, *infuscata*, and *equestraria* were all represented; also a fine series of *E. elinguaria*, including Scotch specimens of a deep, almost orange, colour, and without the usual central fascia on fore wings.—Mr. A. W. Mera, melanic *Gonodontis bidentata* from Leeds, also very pale *E. quercinaria* from Ipswich.—Mr. L. B. Prout, *E. quercinaria* ab. *infuscata* from South Kensington.—Mr. J. Riches, a long and very variable series of *E. quercinaria* from South Kensington.—Mr. V. E. Shaw, pupæ of *Nola cucullatella* and larvæ of *Xylophasia scolopacina* from Bexley.

June 18th.—Mr. J. A. Clark exhibited *Erannis leucophaearia*, very dark specimens from New Forest, with usual median band on fore wings practically obsolete.—Dr. T. A. Chapman, larvæ of *Calocampa exoleta* from South Tyrol, which, instead of being green, as in the case of British specimens, were black, with yellow dorsal and lateral stripes and pale whitish subdorsal line.—Mr. E. A. Cockayne, *Nyssia lapponia* from Rannock, including male with pale yellow dorsal stripe and costa; also, from same district, *Tæniocampa gothica* var. *gothicina*, and an almost unicolorous pale brown *T. incerta* with only the reniform and orbicular faintly indicated.—Mr. H. M. Edelsten, *Chilo phragmitellus* male, a very dark, almost black, specimen from Norfolk Broads; also nearly full-fed larvæ of *Lithosia caniola*.—Dr. G. G. C. Hodgson, two *Nemoria viridata* from Surrey, one with

reddish-brown fore wings flecked with irregular green patches and hind wings of usual green colour except at the anal angle, the other of normal coloration with wings dappled with irregular and symmetrical reddish patches.—Mr. A. H. Shepherd, *Erannis leucophaearia* var. *fuscata* from Huddersfield, and var. *marmorinaria* from Richmond Park.—Mr. C. W. Simmons, *Synopsis abruptaria* from Holloway, including many very dark examples, and an extraordinary hermaphrodite, the right hand wings being those of an almost black male and the left of typical light female.—Mr. A. W. Willsdon, *T. opima* from Epping Forest district, including pale grey specimen with dark-brown central fascia.—Mr. T. H. L. Grosvenor reported having found a batch of *Bombyx rubi* ova on the wing of a dead jay in Ashdown Forest.—S. J. BELL, Hon. Sec.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—June 3rd, 1907.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. E. C. Rossiter again showed a long series of *Tæniocampæ* bred from pupæ dug near Langley Green and Wyre Forest, to show how the species ran into one another; a large series of *incerta*, Hufn., at one end closely resembled those of *mundata*, Esp., and at the other end were with difficulty separated from specimens of *stabilis*, View.; *stabilis*, again, ran into *gracilis*, F.; and there were specimens on each boundary line about which he found it difficult to decide.—Mr. H. Langley showed dark specimens of *Tephrosia luridata*, Goeze, from Princethorpe, where sixty per cent. of the specimens seen were dark; curiously the first to appear were the darkest. The darkest of all were taken on April 20th, and none but dark ones were seen till late in May, when the lighter ones began to appear.—Mr. C. J. Wainwright, insects in amber.—Mr. G. T. Bethune-Baker, a cocoon of *Saturnia pavonia*, L., with two distinct openings; there was, however, only one pupa inside, and it (the cocoon) was of normal size only. He also showed, on behalf of Mr. G. H. Kenrick, a series of *Spilosoma mendica*, Cl., var. *rustica*, Hb., bred from a female captured in the South of Ireland (they all came true to the parent form), also other bred insects. He also showed a number of species of *Spilosoma* and *Phragmatobia* from various European localities, for comparison with Mr. Kenrick's var. *rustica*.—Mr. Chadwick, a visitor, showed various aberrations: *Semiothisa (Macaria) liturata*, Cl., a specimen from Oakley Wood, apparently of the Delamere form, with dark hind marginal band and general dark colour; a very fine dark *Chrysophanus phœas*, L., from near Claverdon, with broad hind marginal and apical band which monopolised most of the dark colour, leaving only two spots on each fore wing, on the hind wings only a narrowish submarginal band of the ground colour was left; the ground colour was a fine dark coppery red, and the insect altogether was darker than Barrett's darkest. Amongst other aberrations shown was a *Spilosoma lubricipeda*, L., with pinkish border to the wings.—COLBRAN J. WAINWRIGHT, Hon. Sec.

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PHALERIA BUCEPHALA, AB.

In the above aberration of *P. bucephala* the general colour is smoky-grey, the double cross lines are black, and the apical patch is ashy-grey clouded with blackish. The head and thorax and the fringes appear to be normal, but the latter are partly rubbed off in the specimen. The hind wings are of the usual colour, but have a dark grey patch, as shown in the figure.

Mr. Esson, of Aberdeen, who kindly sent it for figuring, informs me that the specimen was bred at Forres, and that he saw it alive.

RICHARD SOUTH.

NOTES ON THE HYMENOPTEROUS FAMILY AGATHIDIDÆ.

By CLAUDE MORLEY, F.E.S., &c.

THIS family forms, with the Microgasteridæ, of which I have already treated (cf. Entom. 1906, p. 99), the Areolarious group of the Braconidæ, and is but sparsely represented by four small genera in Britain. It is, however, very widely distributed throughout the tropical regions of Africa and America, and its species appear to be almost or quite exclusively lepidopterous parasites. Our genera are very easily distinguished if the specimens be not carded:—

ENTOM.—OCTOBER, 1907.

U

(2) 1. Mouth-parts produced in the form of a beak AGATHIS, Latr.
 (1) 2. Mouth-parts normal and not produced.
 (6) 3. Areolet present and distinct.
 (5) 4. First cubital cell coalesced with first discoidal MICRODUS, Nees.
 (4) 5. First cubital cell entire EARINUS, Wessm.
 (3) 6. Areolet entirely wanting ORGILUS, Hal.

AGATHIS.

(2) 1. Abdomen centrally broadly red 1. *malvacearum*, Latr.
 (1) 2. Abdomen entirely black.
 (6) 3. Areolet triangular.
 (5) 4. Mouth-parts longer than head; wings nigrescent 2. *nigra*, Nees.
 (4) 5. Mouth-parts shorter than head; wings subhyaline 3. *angelica*, Marsh.
 (3) 6. Areolet quadrangular.
 (8) 7. Palpi red; terebra longer than body 4. *rufipalpis*, Nees.
 (7) 8. Palpi black; terebra as long as body 5. *brevisetis*, Nees.

Agathis malvacearum.—Mr. Donisthorpe has given me this species, which he once found in abundance upon *Malva moschata* at Rye, Sussex, in August.

A. nigra.—Not uncommon. Abinger Hammer, near Guildford, in August, 1900 (E. A. Butler); Devon (Bignell); Greenings, in Surrey, August, 1871 (Wilson Saunders).

A. angelica.—I possess one female from Dr. Capron's collection, probably taken at Shere, in Surrey.

A. brevisetis.—Two females from Abinger Hammer, taken by Butler, and one from Dr. Capron's collection.

MICRODUS.

(10) 1. Second segment not longitudinally aciculate.
 (9) 2. Hind tibiæ red, with apices black.
 (4) 3. Abdomen laterally rufescent 1. *linguarius*, Nees.
 (3) 4. Abdomen entirely black.
 (6) 5. Hind femora black; size $2\frac{1}{3}$ mm. 2. *nugax*, Reinh.
 (5) 6. Hind femora red; size at least 3 mm.
 (8) 7. Size 6 mm.; tegulæ black 3. *claustralitanus*, Rtz.
 (7) 8. Size 3-4 $\frac{1}{2}$ mm.; tegulæ testaceous 4. *tumidulus*, Nees.
 (2) 9. Hind tibiæ black and white 5. *cingulipes*, Nees.
 (1) 10. Second segment longitudinally aciculate.
 (14) 11. Third segment entirely smooth.
 (18) 12. Mesonotum rufescent 6. *calculator*, Fab.
 (12) 13. Mesonotum black 7. *brevicaudis*, Reinh.
 (11) 14. Third segment at least partly aciculate.
 (16) 15. Hind coxæ red 8. *rufipes*, Nees.
 (15) 16. Hind coxæ black.
 (18) 17. Hind tibiæ black and white 9. *rugulosus*, Nees.
 (17) 18. Hind tibiæ red, with apices black. 10. *mediator*, Nees.

Microdus linguarius.—Taken commonly by Butler at Abinger Hammer in August, 1900, and once by Mr. A. Piffard at Felden, in Herts.

M. nugax.—Not hitherto noticed in Britain, and only recorded from Erzgebirge and Frankfort-on-Main. I captured a male on flowers of *Spiraea ulmaria* at Foxhall, in Suffolk, August 10th, 1902, and possess a female taken by W. Saunders in July, 1872, at Greenings, in Surrey.

M. claustralitanus.—Females. Barr, in Ayrshire, in the latter half of July, 1900 (Dalglish); Greenings, in July, 1871 (W. Saunders); and swept in a marsh at Barton Mills, in Suffolk, on June 12th, 1900, by myself.

M. tumidulus.—Abundant. Felden, in Herts (Piffard); Boxhill, in September (Beaumont); bred from *Catoptria hypericana* at Worksop, June 20th, 1904 (Miss Alderson); Greenings, in June, 1871 (W. Saunders); Abinger Hammer (Butler); Shere, in Surrey (Capron); swept from heather at Selby, in Yorks, September 19th, 1902 (Ash). I found the males commonly on tables of *Angelica sylvestris* at Foxhall on August 30th, 1899, and females have occurred to me both there and at Claydon Bridge, near Ipswich, in damp situations, up to September 23rd.

M. rufipes.—Females. Bournemouth, in 1901 (Bradley); Abinger Hammer, early in August, 1900 (Butler); and in the New Forest (Miss Chawner).

EARINUS.

| | |
|--------------------------------------------------|-----------------------------|
| (2) 1. Second segment rufescent | 1. <i>zonator</i> , Marsh. |
| (1) 2. Second segment black. | |
| (4) 3. Hind tibiae apically testaceous | 2. <i>nitidulus</i> , Nees. |
| (3) 4. Hind tibiae apically black | 3. <i>gloriosus</i> , Panz. |

Earinus nitidulus.—Common. Taken at Felden by Piffard, and swept by myself in Tuddenham Fen, May 20th, 1904.

E. gloriosus.—Not uncommon. New Forest (Miss Chawner); Cadney, in Lincolnshire, in 1898 (Thornley); I beat it from birch-bushes on May 11th, 1895, and May 18th, 1903, in the Bentley Woods, near Ipswich; and two males from yew at Hollington, near Hastings, as early as March 21st, 1900.

ORGILUS.

| | |
|--------------------------------------------|--------------------------------|
| (2) 1. Wings normal; palpi black | 1. <i>obscurator</i> , Nees. |
| (1) 2. Wings small; palpi red | 2. <i>micropterus</i> , sp. n. |

Orgilus obscurator.—Not very common. Several at Felden, in Herts (Piffard); one female bred, with one *Apanteles* and one female *Pezomachus rufipes*,* which last was very probably hyperparasitic upon one or other of the Braconids, from *Butalis senescens*, Stn., at Swanage, in Dorset, between June 8th and

* Cf. my 'Ichneumons of Britain,' vol. ii. 1907, p. 190.

20th, 1895 (E. R. Bankes); one female bred from a pine-feeding *Tortrix* [probably *Retinia resinella*, of which it is a known parasite—C. M.] at Oxshott, in July, 1901 (Sich); I have swept it in Tuddenham Fen, in Suffolk, and upon the Ringstead Downs, near Hunstanton, in August, 1906, and beaten it from birch in the Bentley Woods, May 29th, 1902.

O. micropterus.—I took the sexes of this new species on *Angelica sylvestris* flowers at Foxhall on September 12th, 1898, and by sweeping at Ringstead, in Norfolk, on August 21st, 1906; the type is in my collection. From *O. obscurator*, which is the only other black species with the second segment quadrate, it differs in the red palpi; distinct hyaline area below the stigma; anterior femora red, with a narrow black streak above; tibiae red, with the hind ones of male infuscate; trochanters mainly, apices of hind and whole of anterior coxae, red; basal segment thrice (not twice, as in *O. obscurator*) longer than apically broad, with the spiracles very much more prominent; second segment distinctly longer, and, except sometimes at its extreme base, entirely glabrous. The male, in addition, has the flagellum longer and red to beyond its centre. In general facies, *O. micropterus* is distinguished by its distinctly longer legs, with the tarsal joints, especially in male, elongate; the wings do not extend to the anus and are narrower, with the apex and anal angle distinctly less prominent in outline. I find no metathoracic modification such as we are accustomed to associate with the brachypterous forms of usually macropterous *Cryptinæ*.

Monks Soham House, Suffolk:
May 16th, 1907.

NOTES ON THE GENUS *EUPITHECIA*.

By LOUIS B. PROUT, F.E.S.

(Continued from p. 211.)

ALTHOUGH Klos does not mention unequivocally that his second-brood larvæ were feeding on *leaves*, I think it may safely be assumed that such was the case; first, because he mentions that his experience is analogous to that already well known with *E. innotata* (see *supra*), and, secondly, because it would probably be hard to find even whitethorn, to say nothing of blackthorn, still in bloom at the beginning of July, especially in a "forward" district like Gratz.

In its times of emergence *E. virgaureata* seems to be rather an erratic species. Moore (Zool. xx. 8208; Weekl. Ent. ii. 92) had most of his moths appear from hybernated pupæ in May–June, but a second batch from the same lot of pupæ did not emerge

till the beginning of September, while some pupæ—as is often the case with *venosata*, *pulchellata*, *haworthiata*, *expallidata*, *togata*, &c.—went over two winters.

I half suspect that a further analogy to the alternate tree-feeding and flower-feeding habit will be found to exist in another double-brooded “pug,” *Eupithecia albipunctata*. The freshly emerged male found by Crewe on August 19th, and the parents of eggs found by him a few days later (Ent. Ann. 1863, p. 127) could not well have come from larvæ that had fed upon the late-flowering *Angelica*, and Barrett (Lep. Brit. ix. 79) quotes N. M. Richardson as having found that they will feed freely on the leaves of elder, to which an interesting confirmation has just recently (1907) appeared in Dr. Nickerl’s ‘Spanner des Königreiches Böhmen,’ where it is recorded (p. 34) that the senior Nickerl bred a specimen on July 8th from a larva found at Prague in June on elder. Like those of *E. innotata* and *virgaureata*, however, the summer larvæ of *albipunctata* will also accept flowers; for D’Orville, according to Barrett, reared a fine batch, from April eggs, on flowers on *Anthriscus sylvestris*—“there being no other umbelliferous plant obtainable, in blossom, at the time at which these eggs hatched.” Some were full grown in a fortnight, and the imagines appeared early in July.

Our other *Angelica*-feeding *Eupithecia*, *E. trisignaria*, is only single-brooded, and therefore has no trouble in finding flowers or seeds of its usual pabulum at the time when the larva needs it, and I believe all the known food-plants are at least related to *Angelica*. The list given in Hofmann’s ‘Raupen’ is *Angelica sylvestris*, *Heracleum sphondylium*, *Pastinaca sativa*, *Peucedanum dreoselinum*, and *Laserspitium latifolium*. Curiously, Barrett does not mention the only plant upon which I have myself found it—*Pastinaca sativa*, on a single head of which I took, at Horsley, the only two larvæ which yet stand to my account for this species! That there was nothing novel in the selection of this food-plant, even for Britain, is clear from Mr. Sheldon’s note in the ‘Entomologists’ Record,’ vol. i., p. 70. Dietze, however, has a more remarkable observation (Stett. Ent. Zeit. xxxiii. 199). He once found a great number of larvæ on a completely decayed plant of *Angelica*, and actually saw one of them seize an aphis, lift it up after the manner of a *Syrphus* larva, and then suck it dry. On account of the state of the plant, he was convinced that these larvæ must for a long time have supported themselves entirely on aphides; they were of a dark colour which he had not otherwise seen, the dorsal area being entirely black, and he thinks that this may be attributable to the abnormal diet, but I would suggest that it was quite possibly adaptive to its surroundings. One season when *Eupithecia* larvæ were exceptionally abundant, Dietze found this species common everywhere,

and it even attacked *Pimpinella saxifraga*, *P. magna*, and other Umbelliferæ.

Chloroclystis coronata is another species which, while generally associated with one or two plants (notably clematis), can yet thrive on the most diverse. I once beat a larva from hawthorn in the autumn, which must have fed on the leaves and, at any rate, was reared on them; on another occasion I beat one from sallow, which I took to be this species, but I failed to breed it. Last August, near Bude, I obtained several from bramble, in company with those of *Gymnoscelis pumilata*, and I am pretty sure they ate the fruit as well as the flowers—perhaps, also, the leaves. Like Crewe, I have also found it on *Eupatorium* and on *Angelica* when working for others of the genus. In a note on *C. coronata* (Trans. City Lond. Ent. Soc. ix. 52) I expressed a suspicion that the imago hibernated fully formed in the pupal shell; I find this habit was already known to Dietze nearly thirty years before (Stett. Ent. Zeit. xxxiii. 202). The same thing obtains with the hibernating brood of *Gymnoscelis pumilata*.

Probably a longish chapter might be written on the food-plants and larval habits of *G. pumilata*, but I will content myself with one point. Early last year (1906) Dr. Chapman found, at Hyères, on *Cytisus (Calycotome) spinosus*, some unknown geometrid ova, from which the larvæ duly hatched, spent their larval period spun up in domiciles among the leaves, after the manner of *Hydriomena furcata (sordidata)*—which, rather than any “pug” larva, they resembled in appearance—fed up rapidly on *Cytisus* leaves, and at the end of May produced normal *pumilata*.

NOTES ON THE BUTTERFLIES OF DIGNE.

By GERARD H. GURNEY, F.E.S., &c.

(Continued from p. 197.)

Lycæna iolas was well out during the first week of my stay, and in beautiful order, but unless one is lucky enough to get it at the right time, one will find it in rags, as its rapid, dashing flight through the thick scrub soon makes havoc with its wings, rendering it quite useless from a cabinet point of view. It seemed fairly common, though it is difficult to judge to what extent it is distributed, as it flies over a wide area, and is very hard to catch owing to its living on such rough ground; and the males, at any rate, seemed to me never to go near the *Colutea*—in any case, they never came near the particular plants I happened to be guarding; and, after spending the greater part of one day in the grilling sun, watching four bushes on the steep hillside behind the

Cemetery, which those who know it will remember is a perfect sun-trap, and where by ten o'clock the stony ground becomes so hot one can barely place one's hand upon it, and having during that time only caught one chipped female, I did not consider that form of taking *iolas* good enough, and so adopted another which I found was much less heating, more exciting, and withal more productive of the butterfly in question; and this was to stand (more or less still) in an open gully or track, and intercept them as they flew swiftly down the openings, which they seemed to have rather a *penchant* for doing. In this way the time was enlivened by catching an occasional *Pararge mæra* or *L. duponcheli* as it fluttered past, and I was able to take six fine *iolas* in very good condition; but what interested me far more than catching them was to find a full-fed larva feeding quite exposed on a pod of *Colutea arborescens*, and attended by no fewer than four large black ants, of what species I am afraid I do not know, which were continually running backwards and forwards over the larva, stroking or feeling it with their antennæ, in order to get it to exude a drop of the sweet mixture which, no doubt, in the same way as *Polyommatus bellargus* or *Lycæna arion*, it has the power of doing. It appeared to feel no inconvenience from this performance, and was lying basking on the half-eaten pod. The larva was of a very pale yellowish-green colour, with a dark pink or rose-coloured dorsal line, strongly defined towards the head and tail, and lighter in the middle; the subdorsal lines were a much paler and less conspicuous pink, all three lines being rather thickly spotted with minute black dots; the head was of a pinkish tinge, minutely spotted with black; legs very light greenish colour. This very rough description of the larva was jotted down in my pocket-book when I found it, and, although I had no means of exactly measuring it, it must have been almost an inch in length, and was of a very slug-like appearance. When I got back to my hotel that evening I found it had already eaten its way into another pod of *Colutea*, and in this it remained three days without coming out, the two ants which I had put with it constantly going in and out of the hole in the pod, though I could not see what took place inside. On the third day the pod cracked and came open at one end, and I found the larva had changed into a lightish-brown pupa inside it.

I was glad to find that *Thaïs medisicaste*, in spite of various reports to the contrary, seems to be holding its own fairly well, though it is an insect which for some reason is more collected than anything else at Digne. Everyone appears to want a larger series of *medisicaste* than of anything else; possibly its showy upper side, which makes a long row look so well in one's cabinet, has something to do with it; but Monsieur Cotte, the professional collector at Digne, assures me people are far more anxious to secure *un grand numero* of *medisicaste* than of any other insect.

As far as I could make out three *T. medisicaste* var. *honoratii* had been taken this year; Cotte himself had taken a magnificent male three days before I arrived. Small larvæ were fairly common on the *Aristolochia*, basking on the leaves of the plants in the hot sun.

On the 17th, at the foot of the rocks of Les Dourbes, after a very hot climb through the thick beech wood, I found *Parnassius mnemosyne*; males were abundant, but only two females, all in very fresh order; and also, in magnificently fresh condition, flying a little higher up, *Erebia stygne* was common. Here also *Polyommatus eumedon* was plentiful, rather a small form, and only just emerged. One was a very interesting aberration; the under side was of a very pale grey colour, and almost devoid of eye-spots on the fore wings, while on the lower wings the wedge-shaped mark was wanting, and the row of black dots was reduced to two black pin-pricks. Flying here also were a lot of fresh *Gonopteryx rhamni*, *Nemeobius lucina* (in much better condition than lower down), a few *Argynnis adippe* and *B. euphrosyne*, with occasional *Euchloë cardamines*, *Colias hyale*, and a single *Erebia evias*.

On the way down, near the little village of Villars, I saw, in the hay-fields, *Papilio podalirius*, and found several half-grown larvæ of this species on small almond trees; *Pontia daplidice*, *L. arion*, *R. argus*, *Melanargia galatea*, and a sprinkling of "burnets," *Zygæna radamanthus*, a few worn *Z. lavandulæ*, and two other species at present not identified. On the arid hills below Villars I saw hardly anything, but the little *epistygne* wood near the bridge was alive with butterflies; specially abundant were *L. bellargus* and *L. corydon*, with a good many *L. hylas*, and I also noted *L. duponcheli*, *Polyommatus escheri*, *Loewia dorilis*, *M. phœbe*, *M. athalia* (just out), *M. didyma*, and a few *Parage egeria*.

On June 18th *Papilio alexanor* made its appearance, and I took a fine male near the baths, and another later in the day nearer Digne, both off thistle-heads, for which it has a well-known predilection; its food-plant (*Sesili montanum*) still, at this date, was barely showing above the ground. In the little fields beyond the baths and by the Eaux Thermale insects were beginning to be abundant; the two previous days of rain had brought things out wonderfully. *A. adippe* was becoming common, a second brood of *Brenthis dia* was appearing, while *C. arcana*, which was plentiful, was beginning to look the worse for wear. *C. lavateræ*, *L. dorilis*, *E. argiades*, *Thecla ilicis*, *P. apollo*, *P. daplidice* (very abundant), were all noted, besides many commoner species.

My last day at Digne (the 19th) was chiefly spent in the little lateral valley running into the Eaux Thermale; here I took another *P. alexanor* and two *Brenthis daphne*, just emerged. It

was amusing to watch the battles between *Chrysophanus gordius*, which was very abundant, and *T. ilicis* for the "chief seats" on the thyme-flowers, or to see a big *A. adippe* "make for" a purple scabious flower already overweighted and overcrowded with a family party of, perhaps, a couple of *Zygæna trifolii*, a fiery *didyma*, and a *M. galatea*, upsetting them all in a most unceremonious way. The stream-banks here were the favourite places for *L. duponcheli*, *L. dorilis* (not common), *E. argiades*, and *M. athalia*, with the usual quantities of the two "blues," *L. corydon* and *L. bellargus*; while a little higher up, disporting themselves on the now full-blooming privet-flowers, were *T. ilicis* (type) and var. *æsculi*, a few fresh *Cyaniris argiolus*, and some very ragged *Graptæ egea*. During the day I worked round the hill behind Le Bleone, and here some fresh *Euchloë euphenoides* were out, a single worn male *L. iolas*, with *M. galatea*, *P. dapdice*, and *C. gordius* (plentiful); and by the bridge over the river I saw, but did not take, another *P. alexanor*.

I also got the following list of Arctias during my time at Digne, mostly at "light," on the side of La Collette:—*Arctia maculosa*, *A. casta*, *Rhyparia purpurata* (very common), *Arctia hebe* (one only), *A. fasciata*, *Euprepia pudica*, *Arctia villica*.

HINTS ON THE STUDY OF LEAF-HOPPERS.

By G. W. KIRKALDY.

THE neglect in the British Isles—and elsewhere—of the Heteroptera is perhaps comprehensible. The prejudice against the evil-smelling few is extended to the entire suborder, and the interest of their structure and life-history is overlooked. It is difficult, however, to understand why this neglect is even greater in the case of the Homoptera, and particularly the "leaf-hoppers." They possess no malodorous glands, their forms are, if not usually brightly coloured, at least dainty, and some—for example, *Tomaspis sanguinea* (= *Triecphora vulnerata*), *Tetigonia viridis*, *Dikraneura aureola*, and *Eupteryx atropunctata*—are really pretty.

The following brief notes are written to lead some of the younger entomologists to the most neglected of the larger groups of insects, and to notice some of the leading points of interest in their life-histories and structure. The British leaf-hoppers have been very admirably treated, as regards their systematic description and tabulation, by Mr. James Edwards, but a great deal remains to be done in the discovery of new species, the extension of the distribution of those already known, the determination of food-plants, and the working out of life-histories.

(a) *New Species*.—There must be at least fifty more species

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On very hot days the very flying *Polyommatus* only under eye-spots shape to two *Gonepteryx* than ocean *erias*

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to be recorded from the British Isles, and only to reach 325 or 330. As rich localities I would specially recommend the Trossachs in Scotland, but there is scarcely a valley partially worked at.

On known.—The locality records in Edwards's most meagre, which is, of course, not the due to the fact that workers are so few.

—This is a part of the investigation that

It is obvious that a plant may be quite an of a leaf-hopper. For instance, *Platymetopius* recorded from *Pteris aquilina* and from *Quercus* course, it is possible that both records are correct, *undata*. *Platymetopius undata* is so characteristic chance of wrong identification of the species. as it is a well-known fern-feeder, is that it was tree surrounded by fern, the hopper having latter to the former, perhaps on the approach. Though it is well, therefore, to record all plants adults are captured, it is necessary to note in which the eggs are deposited, or upon which found.

ries.—The eggs of nearly all the British forms in slits made by the female in leaves, twigs, the exceptions being *Issus coleoptrata*, which them on leaves, &c., covering them with flocculent *Terigometra impressopunctata*, which lives in ants' under stones, and apparently drops its eggs in the and *Cixius* probably lay their eggs under the of trees.

are more or less like the adult in their four or the rudiments of the flight-organs becoming more apparent in each further stage. The tarsi are not there are other differences, while the nymphs are quite differently from the adult. In the Fulgoroid there are a number of remarkable sensory organs on thorax, tegminal and alar pads, and abdomen.

nymphs are usually easily reared, in most cases test- medium size being all that is necessary. The several should be described, the points to look for being:—(1) the head, which may differ from that of the adult, and, in the various nymphal instars; (2) the pattern and (3) the number, colour, and disposition of the bristly the abdomen. This last character has not been used is of the greatest importance.

Parasites.—Leaf-hoppers are particularly subject to para- which are usually easily reared from them. The ova in and elsewhere will yield Chalcid, Eulophid, and Mymarid

Hymenoptera; the nymphs will be found attacked by Diptera of the Pipunculidæ, Hymenoptera of the Dryinidæ and Eucyrtidæ, and Coleoptera of the Stylopidæ.

(f) *Structure*.—This is discussed sufficiently fully by Edwards. Of particular interest are the male genitalia in the "Delphacidæ" and its allies, the mobile tibial spur in the same hoppers, the legs in various "Jassids" and "Acocephalids," the antennæ of Fulgoroid forms, &c.

I would, however, specially urge anyone wishing to commence the study of leaf-hoppers to rear up the nymphs, which will often be found in company with the adults, to note the plants on which the nymphs feed, and to search the food-plants for indications of the egg-slits. Grasses, rushes, poplars, oaks, and ferns have so far afforded the most species, but the whole flora should be investigated, as many of the hoppers are very sharply restricted in the matter of food-plant.

Anyone proceeding on the general lines I have indicated will find a most fascinating study to hand, and one less worked at than any other insect group of equal extent.

HELPFUL LITERATURE.

EDWARDS (J.).—'The Hemiptera-Homoptera . . . of the British Islands' (L. Reeve & Co., London, 1896). The "Cicadina" are discussed on pp. 1-223, &c., and pls. 1-25, &c. There are two editions—one published at something over £2, I believe, with coloured plates, and a smaller one with two structural plates, published at something less than £1. To those who can afford it, I would strongly recommend the former. It is the only volume of the series in which the coloured figures are not daubs.

PERKINS and others.—Bulletins 1-4 of the Hawaiian Sugar Planters' Association, div. Entom. (1905-1907), dealing with leaf-hoppers and their parasites, comprising about eight hundred pages and nearly sixty plates.

OSBORN and BALL.—"Studies of North American Jassoidea," 1897. 'Proceedings' of the Davenport Academy of Natural Sciences, vii. pp. 45-100, pls. i.-vi. The North American and European Homopteran faunas have a great deal in common, and the British student cannot fail to profit by reading this valuable paper.

A FOSSIL HONEY-BEE.

By T. D. A. COCKERELL.

ABOUT thirty-seven fossil bees have been reported from the Tertiary strata of Europe, but many of these have been merely alluded to, without descriptions or specific names. Of the named species, one is from Corent, France, one from Krottensee, Bo-

hemia, eleven are from Ceningen, Baden, one is from Orsberg, four (very imperfectly known) are from Prussian amber, three (two of them said to occur also at Ceningen) are from Radoboj, Croatia, and four are from Rott, in Rhenish Prussia. The full bibliographical details will be found in Scudder's catalogue of fossil insects, Bulletin 71, U. S. Geological Survey.

Some of the Ceningen species are well preserved, but the others are for the most part so imperfect as to be of wholly doubtful generic position. *Anthophorites gaudryi*, Oustalet, 1870, from Corent, has a curiously fly-like appearance, according to the figure, and, since its hairs are not plumose, it is presumably not a bee. Its wings are not preserved, except a small portion of the base.

The species from Rott, all described by Heyden (1859 and 1862), have been assigned to *Anthophora*, *Apis*, *Bombus*, and *Osmia*. I found in the Museum of Comparative Zoology at Harvard University a series of specimens from Rott, received years ago from Dr. Krantz. They are labelled *Apis dormitans*, *Anthophora effossa*, and *Osmia carbonum*; but it is evident that they were not part of Heyden's material, as they do not agree with his figures and descriptions. The "*Anthophora effossa*," in fact, is an ant, about 5 mm. long. The "*Apis dormitans*" is represented by two specimens, with the venation partially preserved. One is about 15 mm. long, stout-bodied, with the hind margins of the abdominal segments broadly pale, and the hind basitarsus broadened. What can be seen of the venation, of both anterior and posterior wings, will do for true *Apis*, except that the basal nervure almost meets the transverso-medial, only just falling short of it. The transverso-medial of the hind wings is scarcely oblique, thus resembling more that of *A. florea*, Fabr., than that of *A. mellifera*, L., or *A. dorsata*, Fabr. The approximation of the basal nervure to the transverso-medial agrees with the living genus *Melipona*.

The second "*Apis dormitans*" has dark spots at the sides of the abdominal segments, and the basal nervure seems straighter. It appears to be congeneric with the first, but possibly not conspecific.

That these bees are the genuine *A. dormitans* certainly cannot be affirmed. The original figure of that species shows venation which cannot possibly be reconciled with them, even allowing for bad drawing; the size also seems too small.

"*Osmia carbonum*" is represented by a very good specimen, with reverse; and an example of a quite different, much smaller, species, the venation of which cannot be seen. The original *O. carbonum*, as also the original *Anthophora effossa*, was without any visible wings.

The other specimen, with reverse, is evidently congeneric, at least, with the specimens of "*Apis dormitans*." It is undoubtedly

very close to the modern genus *Apis*; separable subgenerically, perhaps, because the basal nervure meets, or almost meets, the transverso-medial, as in *Melipona*. As there is no reason to suppose that it has anything to do with *Osmia carbonum* (which, in any event, is indeterminate), and since it cannot be reconciled with *A. dormitans*, it may be described as follows:—

Apis (Synapis, subg. nov.) henshawi, sp. nov.

♂. Length 15 or 16 mm.; vertex with long erect black hair, as in *A. mellifera*; this hair appears to be plumose; mandibles toothless, obliquely truncate, quite as in modern *Apis*; mesothorax bare; antennæ normal; tongue long, normal; abdomen banded; claws bifid, the inner tooth short, as in modern *Apis*; pulvilli well-developed; sting visible; venation as in modern *Apis*, except that the basal nervure almost meets the transverso-medial, and the upper side of the second submarginal cell seems shorter; the long marginal cell, with rounded apex, the peculiar submarginals, the basal with its lower section much the longest, &c., are plainly visible, but unfortunately the termination of the second recurrent nervure cannot be seen.

The insect is named after Mr. Samuel Henshaw, of the Museum of Comparative Zoology.

The Museum of Comparative Zoology also contains an example of *Anthophorites mellona*, Heer, from Ceningen, determined by Heer himself. It is stout-bodied, 17 or 18 mm. long, abdomen apparently banded; hind tibia visible, and shaped as in *Apis*. The venation cannot be seen, but a large part of it was visible in Heer's original type, as his figure shows.

TWO NEW SPECIES OF AGATHINÆ (BRACONIDÆ)
FROM BORNEO.

By P. CAMERON.

Euagathis leptopterus, sp. nov.

Luteous; the flagellum of antennæ and the hind tarsi fuscous. Wings, including the costa, stigma, and nervures, bright luteous, except for a blackish spot, longer than wide and of equal width, behind the parastigma, the body and legs densely covered with a short pale pubescence. ♀. Length 10 mm.

Wings long, narrow; the areolet 4-angled, narrowed in front; the lower part of the second transverse cubital nervure narrowed and sloped towards the base of the cellule. Malar space a little shorter than the eyes. Parapsidal furrows distinct, but neither wide nor deep. Basal slope of scutellum broadly margined above; behind it are two rows of distinct punctures, the apex rounded, margined by a stout keel. Post-scutellum wider than long, of equal width; the lateral keels stout; a stout keel runs from the middle of the apical one. On the base of the metanotum, in the centre, are three areæ,

all longer than wide; the central is slightly narrowed towards the base, and has a stout transverse keel near the middle; the lateral is widened at the base; the apex is rounded and longer on the outer than the inner side. Mesopleuræ above the stoutly crenulated furrow smooth; below it closely punctured, as is also the sternum. Abdomen smooth, hardly so long as the thorax; the ovipositor short.

Kuching, Borneo.

Allied to *E. borneensis*, Szép., which may be known by the black legs. The species is an exact mimic of *Iphiaulax leptopterus*, Cam., also from Sarawak.

Cremonops satapensis, sp. nov.

Black; covered with short black pubescence; the four tibiæ dark testaceous in front, their tarsi rufo-testaceous; wings black to the base of the stigma, milky-white beyond, the stigma, except at the base and apical nervures, pale testaceous; the areolet almost square; the second transverse, cubital nervure slightly rounded, narrowed behind.

♀. Length 9 mm.; ovipositor 7 mm.

Satap, Borneo. September (John Hewitt).

Malar space longer than the eyes. Palpi testaceous. Scutellar depression deep, large, with three stout keels in the middle. The central area of metanotum extends to the apex, is narrower than the lateral, and has two keels above the middle; its outer keels curve outwardly at the top; there are two lateral areæ, the upper wider and longer than the apical. There is a curved row of foveæ on the base of the mesopleuræ, commencing shortly above the middle; the upper long, narrow, shallow; the two apical shorter, wider, and much deeper, and they reach to the apex, which is bounded by a widely crenulated furrow. Abdomen smooth; the second segment with a distinct curved, transverse furrow beyond the middle; the basal ventral segment is for the greater part white.

This species has the coloration of *Iphiaulax pheres*, Cam., also from Kuching. Along with it Mr. Hewitt sends a Dipteron of exactly the same coloration and size.

CURRENT NOTES (NEW SERIES).

By G. W. KIRKALDY.

(Continued from p. 206.)

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13. LIE-PETTERSEN, O. J.: "Zur Kenntnis der Apterygotenfauna des nördlichen Norwegens," Tromsø Mus. Aarsh. xxviii. 51-76, pl. 1 (December 1st, 1906). Thysanura and Coleoptera.
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17. MUCHHARDT, H.: "Bidrag till Kändedomen om Sveriges Hemiptera och deras utbredning inom landet," op. cit. 125-38.
18. METCALF, M. M.: "An Outline of the Theory of Organic Evolution," ed. 2 (London and New York), i-xxii and 1-212, pls. 1-101 (18 col.), text-figs. 1-46 (1906) [first edition, 1904].

19. PHISALIX, C. : "Sur la présence de venin dans les œufs d'Abeilles," B. S. E. France, 1905, 201-3. Hymenoptera.
20. OBERTHÜR, C. : "Variations de Lépidoptères," *op. cit.* 55-9.
21. PIC, M. : "Sur *Crioceris asparagi*, L., et ses variétés," *op. cit.* 1906, pp. 119-23. Coleoptera.
22. PICARD, F. : "Sur les changements de coloration chez les mâles de quelques Libellulides," *op. cit.* 166-7. Odonata.
23. ROYER, M. : "Synonymie du *Triecphora sanguinolenta*, Scop., et de deux espèces voisines," *op. cit.* 297-8 (1907). Hemiptera-Homoptera.
24. ID. : "A propos d'*Elasmostethus minor*, Horv.," *op. cit.* 287-8, figs. 1-4 (1907). Hemiptera.
25. SILVESTRI, F. : "Note sur Machilidæ," *op. cit.* 325-40, figs. 1-15 (August 18th, 1906). Thysanura.
26. ID. : "Contribuzione alla conoscenza dei Termitidi e Termitofili dell'Eritrea," *op. cit.* 341-59, figs. 1-22 (September 28th, 1906). Coleoptera, Neuroptera, Diptera.
27. SCHNEIDER, J. S. : "Saltdalens Lepidopterfauna 2det bidrag," Tromsø Mus. Aarsh. xxviii. 103-62 (February 26th, 1907).
28. TULLGREN, A. : "Intryckforan en praktiskt-entomologisk studiereresa i utlandet, sommaren 1906," Ent. Tidskr. xxvii. 159-81 (December 29th, 1906).
29. WAHLGREN, E. : "Svensk insektfauna. 1. Första ordningen. Borstvansar och Hoppstjärtar. Apterygogenea," *op. cit.* 233-70, figs. 1-30 (December 29th, 1906).
30. PERKINS, R. C. L. : "Parasites of Leaf-hoppers." KIRKALDY, G. W. : "Leaf-hoppers," Bull. Exp. Sta. H. S. P. A. iv. 1-66 (May 1st, 1907). Hymenoptera and Hemiptera.

Metcalf's work is drawn largely from entomological sources (18). Lampa's Report on the Work of the Entomological Division of the Swedish Agricultural Station for 1905 contains brief notes on a number of more or less noxious Swedish insects, most of which are also British (15).

Tullgren publishes his impressions of the economic work done at Copenhagen, Hamburg, Wageningen, Geissenheim, Vienna, Budapest, Halle, and Berlin (28).

Silvestri continues his researches on Machilidæ, and promises a monograph. Incidentally he gives a synoptic table of the palæarctic species of *Machilis* (25). Wahlgren (29) synopsizes the Thysanura and Collembola of Sweden in a paper which will be useful to British workers, while Lie-Pettersen (13) contributes to our knowledge of these forms in Northern Norway.

Berlese describes and discusses the morphology and anatomy of a Locustid with two ovipositors (3).

Horváth has monographed the palæarctic Tingidæ, with tables of genera and species, and references to food-plants. The coloured plate is one of Fieber's, unpublished for about forty

years (10). Muchhardt briefly notes fifteen Swedish Heteroptera, most of which occur also in Britain; information on food-plants and localities is afforded (17).

Royer has shown (23) that there is some confusion in the names given to three of the commoner European *Tomaspis*, the name "*sanguinolenta*, Linné" being later than "*sanguinolenta*, Scopoli." The correct synonymy he gives as follows:—

- (1) *sanguinolenta*, Scopoli, 1763 = *mactata*, Germ., 1821 = *distinguenda*, Kirschb., 1868, &c.
- (2) *sanguinea*, Geoffroy, 1785 = *vulnerata*, Germar, 1821, &c.
- (3) *intermedia*, Kirschbaum, 1868 = *obliterata*, Kirschb., 1868 = *sanguinolenta*, Linné (pt.), 1766.

"*Sanguinea*," however, was preoccupied in *Cicada* before 1763, so that we can still call the British species *Tomaspis vulnerata*.

The recent addition (24) to the French hemipterous fauna of *Elasmostethus minor*, a Cimicid up till recently confused with *E. interstinctus* (Linn.),* makes it possible that the former is to be found in the British Isles. The food-plant is, it is true, an introduced plant, now, however, thoroughly established, and the bug should be looked for either on this or on its congener, the honeysuckle. The differences between the two forms may be stated as follows:—

| | INTERSTINCTUS. | MINOR. |
|--------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|
| ♂. Second genital segment. | With a small black spine at the side posteriorly. | Not spinose. |
| ♀. Genital segment. | Truncate apically in the middle. | A little emarginate apically in the middle. |
| Angle formed by the meeting of this and of the last tergite. | Obtuse. | Acute. |
| Food-plants. | <i>Betula alba</i> , <i>Salix</i> ,
<i>Populus</i> . | <i>Lonicera xylosteum</i> . |

Jeannel records (12) a *Carabus* with the third segment of the right antenna trifid. This segment is flattened and dilated, wider apically than basally, giving rise to three segments at its apex, the two supplementary branches each being composed of

* *E. interstinctus* (Linn.) = *Acanthosoma dentatum* of Saunders's Hem. Het. Brit., and must not be confounded with *A. (E.) interstinctum* of the same work, which = *griseus* (Linn.).

two segments. Pic (21) discusses the varieties of the asparagus beetle.

Dupuy states that *Smerinthus tiliæ* is double-brooded in some parts of France (6).

Sparre Schneider has a lengthy list of Norwegian Lepidoptera (27), with a full discussion.

Federley gives a résumé of the temperature experiments on Lepidoptera of Weissmann, Merrifield, Standfuss, and others (8). Lampa discusses the metamorphoses and habits of *Argyresthia conjugella*, which, in Sweden as in Britain, feeds on rowan berries (*Pyrus aucuparia*). He also deals with *Carpocapsa pomonella*, and the sawfly, *Hoplocampa testudinea*, on apple, though the two last are not indicated in the title. The paper is illustrated by a coloured plate (16). Oberthür has brief notes on certain varieties of *Chrysophanus phœas*, *Abraixas grossulariata*, &c. (20).

Picard (22) states that the males of those dragonflies which are different in coloration from their females are not so at their emergence from the nymph or for some days after; this seems to be due to the fact that spermatogenesis is not finished, as in most other insects, at the instant of emergence, but is delayed for some days.

Phisalix demonstrates the presence of venom in the eggs of bees, in the proportion of about the one hundred and fiftieth part of the weight of the egg. A young sparrow died two hours after inoculation from an injection of an emulsion resulting from the preparation of nine hundred and twenty-six bees' eggs (19).

Ferton continues his notes on the habits of Hymenoptera, dealing with *Osmia*, *Tachysphex*, *Gorytes*, *Pompilus*, *Chrysis*, &c. The plates principally show the insects attacked and the manner of attachment of the egg (9).

R. du Buysson has monographed Nectarina—a genus of social wasps inhabiting America only, not neglecting to summarize (in three and a half pages) their biology. Four of the six plates figure nests of various species (5).

Lesne has made notes on the habits of a Trypetid and of an Agromyzid attacking asparagus (14).

Bau and Brues have monographed the genera of certain Diptera (1 and 2); in the Estrinæ twenty-one, and in the Phoridae twenty-three, genera are recognized.

All Theobald's subfamilies of Culicidæ are held by Dyar and Knab to be untenable, these authors finding only two, Culicinae and Sabethinæ. The classification based on palpi is ruled out, the differences being of a secondary sexual nature, and sometimes variable within the limits of a single species. One new character is used, *i. e.*, a tibial comb, which is supposed to act as a cleansing organ for the body parts or wings (7).

Perkins (30) continues his researches on parasites of leaf-hoppers, summarizing his observations.

NOTES AND OBSERVATIONS.

MALE LASIOCampa QUERCUS ATTRACTED BY (?) ODONESTIS POTATORIA FEMALE.—On July 14th, in the neighbourhood of Abersoch, Carnarvonshire, I found a very much crippled moth, which, with some hesitation, I concluded was a female *Odonestis potatoria*. The wings were almost scaleless and very short. I put the specimen in an ordinary glass-bottomed pill-box, intending to try "sempling" in the evening on the sand-hills. My companion put the box in his pocket, and shortly afterwards, about 4 p.m., netted a moth which came persistently flying round him. This moth was a male *Lasiocampa quercus*. In the evening males of *O. potatoria* "sembed" freely. Several were boxed, and one paired with the crippled specimen, which undoubtedly was *O. potatoria*. Whether it attracted the male *L. quercus* in the afternoon, or whether it was merely a coincidence that the latter came flying round, I am unable to say, but am inclined to think it came on a false scent. I may add that we had not been taking *L. quercus*, and none of our boxes had contained any female of this species during this season.—A. HARRISON; Delamere, S. Woodford.

RE-OCCURRENCE IN BRITAIN OF PYRALIS LIENIGIALIS, Z.—So far as I was aware last spring, the only captures of this species in Britain had been made by Messrs. J. Bryan and W. Thompson, who secured several specimens near Stony Stratford, Bucks, in and about the year 1880, as recorded by the latter gentleman in Entom. xiv. 84-85 (1881), and also in Ent. Mo. Mag. xvii. 256 (1881). It was, therefore, with special pleasure and interest that, on May 29th last, whilst glancing through the collection of Lepidoptera formed by Mr. Vernon P. Kitchen, just prior to its dispersal by auction at Mr. Stevens' rooms, I caught sight of a specimen of *Pyralis lienigialis*, Z., standing in the series of *P. farinalis*, L. Fortunately for me it apparently escaped the notice of others, and the Lot in which it was included became my property at a nominal figure. The individual in question was labelled "Haddenham," and further information, kindly supplied by Mr. Kitchen, shows that it was taken by him at Haddenham, Bucks, in 1903. It is a curious coincidence that the only two ascertained British localities for this scarce insect (whose life-history is, I believe, still altogether unknown), although lying rather over twenty miles apart "as the crow flies," and very near the boundary-line of the county, happen to be both situated in Buckinghamshire.—EUSTACE R. BANKES; Norden, Corfe Castle, August 19th, 1907.

ON THE DISCOVERY OF THE FOOD-PLANT OF ACIPTILIA (BUCKLERIA) PALUDUM, Zell.—In the course of his kind references to myself in his interesting note under the above heading (*antea*, pp. 187-8), the Rev. O. P. Cambridge says, "There remained, however, one plant—the sundew (*Drosera*)—whose likelihood to be the true one certainly never crossed our minds; though Mr. Bankes tells me that it did occur to him some few years ago, but only to be dismissed at the time as an untenable idea." The matter is now of very secondary importance, but since I am unable to accept this last clause as accurate, Mr. Cambridge will, I feel sure, forgive me for mentioning that he must have misunderstood some of my remarks to him on the point, as is proved

by my statement that was published in Mr. Tutt's *Nat. Hist. Brit. Lep.* v. 497 (1906). It runs as follows:—"Although *Drosera rotundifolia*, from its well-known peculiarities of structure, &c., and carnivorous habits, seemed so unlikely to be the food-plant of *Buckleria paludum*, I had suspected, ever since 1890, that it might be so, from having then noted it as apparently the only possible food-plant which was common to the spots known to me for the insect. A thorough search, however, on this and other plants, in 1891 and subsequent years, produced no result, doubtless owing to the great abundance of *Drosera* and the scarcity of the larva." It is obvious that, if my suspicion that *Drosera* was the food-plant had been "dismissed at the time as untenable," I should not have taken the first opportunity, after it had been aroused, of thoroughly searching that plant in the hope of finding the larva, and have renewed the search thereon in other years.—EUSTACE R. BANKES; Norden, Corfe Castle, August 26th, 1907.

INCREASE OF BUTTERFLIES IN MAURITIUS: A CORRECTION.—In the June number of the 'Entomologist,' Captain Tulloch, when writing on the above subject, refers to a letter of mine, in which I had stated that I had captured *Zizera maha* in Mauritius. The insect was not as I supposed, *Z. maha*, but *Z. autanossa*, Mabille. My excuse must be that, at the time, I had no collection or books to refer to, and was speaking from my recollection of *Z. maha*. The point of the correction, however, lies in the fact that *Z. maha* does not occur in the Ethiopian region, and its reported capture in Mauritius might lead to the faulty inference that Mauritius, so far as its butterfly fauna is concerned, had some connection with the Oriental region.—N. MANDERS, Lieut.-Col. R.A.M.C.; Glastonbury Abbey, August 23rd.

NOTES ON *LYCÆNA ARGIADES*, Pall.—Under the above heading, in the number of the 'Entomologist' for September, 1907, Mr. N. C. Rothschild (p. 201) says he "should be interested to know to which form the few known British examples of *L. argiades* belong"! These forms are detailed and discussed in the previous portion of his paper. As I possess two out of, as I believe, the only three authenticated British specimens of this insect, perhaps it will be sufficient for Mr. Rothschild's purpose if I offer the following remarks on my two specimens. The male has two orange spots beneath the hinder extremity of each hind wing. The female (almost entirely black above) has a small dull orange spot (in connection with a small black one) just above the base of the little tail on the upper side of each hind wing. The third British example I have alluded to was taken at Bournemouth on August 21st, 1885, by a Mr. Tudor, then a pupil at the "Forest School," Walthamstow. This specimen was thus captured practically at the same time as the two on which I have given the above information, and subsequently I examined it myself in Mr. Tudor's collection at the Forest School. The only other examples, so far as I am aware, that have laid any claim to British origin are two (both males) recorded by the Rev. J. S. St. John in the November number of the 'Entomologist,' 1885. I had some correspondence with Mr. St. John on the subject of these two specimens, the result of which was my conviction that their origin was Continental, not British. They passed out of Mr. St. John's possession, and subse-

quently came into the auction-room, in London, where, as I was informed by several entomological friends, there was very little faith in them as genuinely British specimens. They were purchased, however, by the late Mr. C. W. Dale, and are now in that gentleman's collection, in the University Museum, Oxford. For a description and figures of my two specimens, see Proc. Dors. N. H. & A. F. Club, vol. vii., 1886, p. 79, pl. v.—O. PICKARD-CAMBRIDGE; September 7th, 1907.

CAPTURES AND FIELD REPORTS.

MYELOPHILA CIRBRUM IN SURREY.—This species is not uncommon now in this district. I first met with it (in the larva state) three years ago, when looking for the larva of another species, in dead thistle stems, and have found it sparingly each winter since. I did not meet with the imago until last year, when I noticed a single specimen in the garden; but in July last I noticed quite a dozen when crossing a field near here which has not been cultivated for three years, and is now overgrown with rough herbage. They were sitting singly and in pairs on the leaves of their favourite food-plant (*Carduus lanceolatus*). I have found the larva at Sutton, so that it appears to be working across the county in a westerly direction. I am strongly of opinion that it has reached this part of the county very recently from Kent. Mr. W. R. Jeffrey (Ent. Mo. Mag. xli. 235) recorded its occurrence near Ashford and eleven miles west of that town, and suggested that it might have reached Surrey, which is undoubtedly the case.—A. THURNALL; Thornton Heath.

With reference to your note on the occurrence of *Myelophila cibrum* in Surrey, I may state that I took three specimens at light on Tooting Common on the 1st July, 1905.—JOHN ALDERSON.

I captured two specimens of *M. cibrum* at light here on July 3rd last.—PERCY RICHARDS; Queen's Road, Kingston Hill.

LEUCANIA UNIPUNCTA IN DEVON.—On September 7th my father took a perfect specimen (bred condition) of *Leucania unipuncta* (*extranea*) on sugar at Paignton.—P. P. MILMAN; Cyprina, Paignton, Devon.

SPHINX CONVOLVULI IN DURHAM.—I beg to report that a specimen of *S. convolvuli*, in moderate condition, was taken at rest in his garden here by Mr. J. Taylor on the 17th inst. I believe that this is the first time this fine insect has been taken in this city.—T. MADDISON, F.E.S.; South Bailey, Durham.

SIREX GIGAS IN WILTSHIRE.—A fortnight ago a friend of mine captured a specimen of the above insect at Woodford, near here, and brought it to me alive. I have only just succeeded in identifying it. Possibly the capture may be of interest.—W. A. BOGUE; Wilts and Dorset Banking Company, Limited, Salisbury, September 9th, 1907.

HELIOTHIS PELTIGERA IN SOUTH DEVON.—In this uncanny season it may be of interest to record the finding of *H. peltigera* larvæ, and that the moths are now emerging. I took six during the second week in August in South Devon; these went to ground in a few days, and

to-day (September 3rd) the first moth emerged. Is not this period of pupation unusually short, seeing that pupæ were only under the influence of ordinary kitchen temperature and by no means hardly forced?—LESLIE BURT; Broadley, Coedcanas, Begelly, R.S.O., Pembrokeshire, September 3rd, 1907.

COLLECTING ON THE LINCOLNSHIRE COAST.—Between the Humber and the Wash there extends a stretch of coast line of slightly convex outline and similar in character along its length. About the centre is placed the village of Sutton-on-Sea, a place unknown to me before the present year and possibly new to some of my brother entomologists, so that a few notes thereon may be of interest. I spent two short periods there, between August 6th and August 20th, and during that time it rained every day. This, I believe, is unusual, for the district is noted for dry bracing air and sunshine. The place is easily described. The shore, which is of great extent at low tide, consists of very firm sand, interspersed with patches of hard, slippery mud. Next the shore is a range of high sand-hills, averaging fifty feet high, with a width of, perhaps, seventy yards at their base, bare on the side next the sea and covered with growth on the land side. Behind the dunes flat fen-land stretches for several miles, but some slight undulations are to be found, and hills can be seen in the distance some eight miles away. The growth on the dunes is mainly couch grass, with some marram, false oat, and other grasses, ragwort, knapweed, hounds'-tongue, thistles, burdock, and other weeds, as well as large areas of elder and sea-buckthorn. The land behind the dunes is mostly arable, but there is some pasture, and many water-weeds and rushes grow in the dykes that separate the fields and in the hollows that have been dug for clay. The weather prohibited much work in the daytime, for the winds were strong and the sky mostly cloudy. Butterflies were naturally few, and those seen comprised *Pieris rapa*, *P. napi*, *Vanessa urticae*, *Epiniphele ianira*, *E. tithonus*, and *Chrysophanus phœas*. *Porthesia similis* and *Leuconia salicis* were common enough. *Bryophila perla* was to be found on the walls, and *Eubolia limitata* was in fair condition. On sugar in the evenings there was no lack of insects. They arrived early, as soon as the mixture was put on; they stayed late; they fought persistently, and were hardly to be driven away. Most noticeable among them was *Xylophasia monoglypha*. It simply swarmed; its ferocity was wonderful to see, and it showed a fine variation from the lightest to the darkest forms. The next plentiful insect, perhaps, was *Miana literosa*, but *M. bicoloria*, *Triphena pronuba*, *T. comes*, *Xylophasia lithoxylea*, *Leucania pallens*, *L. impura*, *L. lithargyria*, *Apamea didyma*, *Agrotis exclamacionis*, *A. nigricans*, *A. tritici*, *Noctua c-nigrum*, and *Hadena oleracea* were in some numbers, accompanied by a few *Acronycta psi*, *Calamia phragmitidis*, *Cerigo matura*, *Mamestra brassicae*, *Caradrina alsines*, *Agrotis vestigalis*, and *Acidalia dimidiata*. *Laperina testacea* came to light but not to sugar. Possibly a longer list could have been made from insects on sugar but for the aggressiveness of *X. monoglypha*. That is, I fear, an oft-repeated tale, but I have never seen it so well merited as in this instance.—B. W. ADKIN; Trenoweth, 8, Hope Park, Bromley, Kent.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—
July 25th.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Newman exhibited a long bred series of *Arctia villica* from larvae collected in North Kent, and including a number of asymmetrical forms with aberrant markings.—Mr. R. Adkin, the coleopteron *Anobium panaceum*, which had been found destructive to sample packets of tobacco.—Mr. Sich, a specimen of *Tortrix pronubana*, taken in his garden at Chiswick.—Mr. South, a short series of *Abraxas sylvata*, including some curiously clouded forms.—Mr. West (Greenwich), three rare species of Hemiptera from the New Forest, *Esycorus aeneus*, *Corixus maculatus*, and *Lopus gothicus*.—Mr. Step, photographs of Lepidoptera at rest, taken during the field-meeting of the Society at Box Hill.—Mr. Clark, an unusually pink form of *Amorpha populi*.

August 8th.—President in the chair.—Mr. South exhibited a hybrid specimen of *Malacosoma*, *M. castrensis* \times *M. neustria*, and read notes.—Mr. Montgomery, a bred specimen of *Toxocampa craccæ* from North Cornwall.—Mr. Newman, an exceptionally pink form of *Saturnia carpini*, a very dark form of *Smerinthus ocellatus*, a dark bred *Arctia caja*, living larvae of *Ennomos autumnaria* from Dover, and a cocoon of *Anthrocera filipendulae*, from which the pupa had been extracted by birds.—Mr. Goulton, a female of the sawfly, *Sirea gigas*, from Sutton.—Mr. Sich, the egg-shells, mines, cocoon and imago of *Cemostoma laburnella* from Chiswick.

August 22nd.—President in the chair.—Mr. Harrison exhibited series of *Hyria muricata* (*auroraria*) from Wicken and the New Forest, and made remarks on the variation of the species.—Mr. Tonge, the living larva of *Saturnia pyri*, from Continental ova and larvae of *Dipterygia scabriuscula* from ova laid by a female taken at Reigate.—Mr. Newman, a larva of *Dicranura bicuspis* from Tilgate Forest, and pointed out the difference from *D. bifida*.—Mr. Turner, specimens from West Australia, including (1) *Delias aganippe*; a brilliant Pierid—*Apina callisto*; a Noctuid moth—*Lycænesthes inoue*; the Pyrale *Mecyna polygonalis*; and the two Tineids, *Cryptolechia alveola* and *Tinea clathrata*. (2) Three cases of a large species of Psychid, *Ecetius* sp. ?, made of short twigs, with a number of parasites of the genus *Bassus*, which had emerged from one case. (3) Examples of the *Coccus*, males, called the “Paradise fly.” (4) A series of the males of the Lamellicorn beetle *Rhipidocera femorata*, with beautifully developed antennæ. (5) A specimen of *Helæus femoratus*, a Tenebrionid with curiously developed margins to the thorax and elytra; and (6) a *Gordius* worm extracted from the abdomen of an *Erebia ligea*, taken on the Rigi, Switzerland, on August 29th.—Mr. Moore, numerous species of Lepidoptera taken during a short trip to Wimereux, and read notes on the exhibit, which included *Anthrocera trifolii*, *Melanargia galatea*, and *A. meliloti*.—Dr. Chapman, a specimen of *Lycæna eumedon* from Gavarnie, Pyrenees, apparently an extreme form of the ab. *subradiata*; and a specimen of *L. argus* (*agon*) with unusually well-marked spot variation on the under side.—Mr. Rayward, living larvae of *Cucullia lychnitis*, and remarked on a curious colour difference between larvae captured and those from ova in captivity.—Mr. Turner, larvae of *C. verbasci* and *C. lychnitis*, and pointed out the difference in markings. He also showed a specimen of the large

mud-wasp, *Sceliphron latus*, with its nest, from West Australia.—Mr. R. Adkin exhibited specimens of *Euvithecia dodoneata* from Eastbourne, taken on the cliffs, and, commenting on their occurrence so far from the nearest oak-trees, suggested that their food-plant had been the evergreen oak, which grew somewhat near where they were taken; he also showed a series of *E. oblongata*, bred from flower-heads of *Centaurea* at Eastbourne.—Mr. Sich, cases of *Coleophora albicosta*, found on a furze-bush in Surrey; and also the larvæ of *Pararge Mara* from ova, and feeding on *Poa annua*, but only in the early morning and in the evening.—*Hy. J. TURNER, Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*July 1st, 1907.*—Mr. R. S. Searle in the chair.—Mr. Hubert Langley reported finding *Stauropus fagi* in Princethorpe Woods, near Leamington, on June 15th and 22nd last. This was the first certain record in the county. Also at the same place, *Larentia silacea*, *Boarmia roboraria*, and *Lymantria monacha*. He also showed males of *Dasychira pudibunda*, taken on the wing one night in the same wood, and said that on that night they were quite common.—Mr. R. S. Searle showed bred *Chærocampa elpenor* from Wicken, together with a hymenopterous parasite from same, probably *Protichneumon laminatorius*.—Mr. J. T. Fountain, another ichneumon which he had bred, also from *elpenor*, one of the large red species; Mr. Fountain showed also a bred series of *Angerona prunaria*, including all its forms.—Mr. Langley, a number of cocoons of a hymenopterous parasite bred from larvæ of *Geometra papilionaria*.—*COLBRAN J. WAINWRIGHT, Hon. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*September 3rd, 1907.*—Mr. A. J. Wightman, of Lewes, was elected a member of the Society.—Mr. S. J. Bell exhibited *Zygæna trifolii-major* from North Cornwall, end of July, 1907; in most of the specimens the spots were more or less confluent, while in one instance they were merged into one large blotch occupying two-thirds of the wing area.—Rev. C. R. N. Burrows, larvæ of *Hemithaea thymiaria*, feeding on thyme; also *Orthosia epsilon ab. nigrescens* (Tutt), *Grammesia trilinea ab. obscura* (Tutt), and *Xylophasia monoglypha ab. infuscata* (White), all from Mucking.—Mr. J. A. Clark, *Dryas paphia* reared from *valezina* ova; of twelve specimens bred five were *valezina*.—Mr. H. M. Edelsten, *Zygæna trifolii-major* from Norfolk Broad, late July, 1907, mostly with confluent central spots.—Mr. T. H. L. Grosvenor, larvæ and pupæ of *Nemeobia lucina* reared from ova laid by a West Horsley female.—Dr. G. G. C. Hodgson, a long series of *Spilodes palealis* taken at Dover between July 24th and August 3rd, 1907; also *Polyommatus phlaeas* var. *intermedia* from Reigate, and *Chærocampa porcellus* with right wings of normal southern coloration and left wings of almost unicolorous yellowish shade often seen in northern specimens.—Mr. C. P. Pickett, a yellow *Callimorpha dominula* from Deal, and *Lycæna alexis ab. obsoleta* from Clandon.—Mr. J. Riches, *Abraxas grossulariata* from North London, with wings thickly "powdered" with black scales.—*S. J. BELL, Hon. Sec.*

ON THE REARING OF *PAPILIO PODALIRIUS*.—The name of the writer of the note on this subject (*ante*, p. 211), there omitted, is Francis T. Gilliat, Forest Dene, Worth, Sussex,



Ova of *Rusticus zephyrus* var. *lyctidas* $\times 10$
(Bérissal).



A. E. Tonge photo.
Ova of *Lycena alcon* $\times 10$
(Binn).

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NOTES ON A SUMMER TOUR IN SWITZERLAND.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(PLATE V.)

IN a short paper dealing with a tour in Southern France this May (*antea*, p. 149), I had good reason to deplore the continual overcast weather which militated so strongly against success with the butterflies of that region, and also the lateness of all such species as actually were observed. I regret to say that I must take up the parable again with much the same comment, for though in Switzerland the weather from the middle of July onward to the middle of August was as a rule sunny and warm, the effects of a cold cloudy spring, continued right through to the very eve of my arrival, told disastrously on the "bag" which in an ordinary Swiss season should be large in comparison with the more select captures of less well-known and ably worked localities. It is nine years since I wandered in the Alps of Switzerland, and great have been the changes in the interval. Generally speaking, the whole aspect of the country has altered. Numerous hotels have sprung up; the remoter valleys are seamed with narrow-gauge railways; the Jungfrau line nears completion, and another is already contemplated which shall bring the Matterhorn in reach of the ordinary tourist. Entomologically a great deal has been added to our knowledge of the Lepidoptera. An industrious entomological society has come into being in Geneva; a sound handbook for British collectors—Mr. George Wheeler's—has been published, and several resident Englishmen, as well as many summer visitors, have concentrated their attention not only on butterfly-hunting as a pastime, but upon the interesting problems presented by the rich Alpine fauna, and the earlier stages of many species which were practically unknown to contemporary writers.

Remembering the abundance of butterflies in the early nineties, and anticipating something of the same kind to fill up

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the blanks and renew the battered series of those years in my cabinet, I was hardly prepared for the disappointments of the summer of 1907. However, this fact is clear in my experience that even in a bad year, compared with other countries visited, Switzerland easily maintains supremacy in the matter of mere numbers. The old Simplon Road, now happily deserted by a great part of its travellers, who prefer the half-hour tunnel to the nine hours' diligence route from Brigue to Domodossola, seemed prolific enough as far as Berisal. A two days' expedition to Éclépens, while introducing me to a new Switzerland, discovered a sufficiency which I should have reckoned rich had I not been told that the scarcity of butterflies there was phenomenal; and this by the tried collectors who have worked the locality, of whom I was fortunate enough to encounter on the spot the Rev. F. E. Lowe and Mr. G. O. Sloper.

Éclépens lies midway between Vallorbes and Lausanne, and may be reached from either, detraining in the first case at Le Sarraz, or at the station which bears its name, on the Yverdon-Lausanne Railway. Mr. Lowe and Mr. Wheeler have given elsewhere some account of its treasures in a good year. As far as *species* go, I found most of the things mentioned by them; and Mr. Reed, of Tunbridge Wells, had apparently been more fortunate with those I overlooked. Low wooded hills—oak and poplar—offer fine cover for the Apaturids. In the open ground a fine thickly scaled creamy form of *Parnassius apollo* (= var. *pseudonomion*, Christ.) was making its appearance on July 13th, where also on the lower bushes of blackthorn and privet *Thecla pruni* and *T. ilicis* occurred singly. In the glades *Limenitis sibylla* was not uncommon; and here also, for the first time, I found *Pararge achine* in good order and frequent. Following Mr. Wheeler's directions, I wound up a short day's work with a visit to the marsh on the Sarraz Road. But it was this year practically drawn blank, only a few *Melitaea dictynna* falling under observation, though I did capture one or two *Lycæna arcas*, but these far too worn to require a box. All my time this day was spent on the left-hand side of the railroad from Lausanne to Yverdon; on the 14th I devoted my attention entirely to the woodlands and hills on the right, and with considerably better results. Leaving Éclépens Station, a field road diverges from the main about a quarter of a mile to the east, leading up the hill, then through some promising copse-land, and past a large farmhouse, skirting the forest which is famous for its "Emperors." *L. sibylla* and *P. achine* were again to the fore, with *Euvanessa polychloros* freshly emerged; while far out of reach as yet soared *Apatura iris* in company with *A. ilia*. However, where a tiny brook had splashed the path and made congenial mire, I was soon brought to closer quarters with these splendid butterflies. Here *ilia* predominated, and the only one

of its several named varieties and aberrations I took was a single female, which I refer to Staudinger's ab. *astasioides*; and here also I took on the way back the only female *iris* seen. The road now winds up through the trees, and there Mr. Reed had captured *L. populi* a day or so before. But it was not until I reached the top of the hill and struck along the Lausanne Road that I found *iris* and *ilia* in any quantity. Unfortunately nearly all were worn; but from the droppings, which proved an irresistible bait for their majesties, I managed to net a few good examples. The temerity of these individuals was amusing and somewhat trying, for, after capture and rejection, I kept taking the veterans again and again. And once settled to their banquet, they might have been caught with the fingers! There were, however, no females here at all events, and but few other butterflies, except *Aphantopus hyperanthus*, occasional *Thecla ilicis*, and *Adopaea thaumas*, in the likely looking wastes by the roadside. Of the few day-flying moths noticed, *Lasiocampa quercus* and *Anthrocera loniceræ* may be mentioned. But the afternoon closed in with cloud and more wind, and early next morning I was on my way in the Simplon express to Brigue and the Upper Rhone Valley.

I certainly thought the proverbial bad luck of old years, which has attended my Swiss expeditions in the way of weather, was going to continue when I drove up to Berisal on the 15th from Brigue. The first half of the well-known drive, now perhaps less used than heretofore, and therefore so much the pleasanter for collecting, was performed under a blue sky. *Euvanessa polychloros* had already put in appearance at this comparatively high altitude, and males of *Epinephele lycaon* were flying with a very brilliant form of *Melitaea phœbe* long before I reached the famous "Second Refuge," where just ten years previously, in August, I had sought in vain for *Rusticus zephyrus* var. *lycidas*. Leaving the carriage to go on, I descended at this classic spot, but alas! the sky had clouded over, and scarcely anything was a-wing; just a few *R. argyrogynomon*, Brgstr., to raise false hopes, and kicked up from the herbs occasional *P. escheri*—afterwards found here in abundance with females, which I have usually missed or overlooked—and a scattering of *Melanargia galatea*. On this afternoon there were no *lycidas* on view, but the slopes affected by its favourite *Astralagus* bore all too eloquent testimony to the attentions bestowed on this pretty butterfly, which happily is by no means confined, as was once thought, to this particular locality in Switzerland. Had the manœuvres already commenced, I should have said that a regiment of cavalry at least had pounded over the ground; but when on subsequent days I returned to the chase, I was fortunate to capture several really fine specimens, though I fancy the species had been out a fortnight at least when I arrived. On the

under side especially the males have a remarkable likeness to *escheri*, and I captured more than one of this fine "blue" under the delusion that I had secured its rarer congener. But the females are more distinctive on the upper side, with the several orange spots at the anal angle of the lower wings, and these were busy ovipositing on the *Astralagus*, though never common. Close by I noticed the only specimen of *Carcharodus lavateræ*, a male, encountered this year in Switzerland; while the Simplon Road, usually so prolific up to the Ganter Bridge before the hotel, was somewhat of a disappointment, so few and far between were the butterflies one looks for in this region. *Melitæa didyma* was just emerging; *M. dictynna* already well advanced; *Brenthis euphrosyne* generally common but worn, and belonging, I conclude, to the first brood. The larger fritillaries were for the time being conspicuous by their absence, and I continued to take insects which generally are well over, as to the first brood, by the first week in July—*Nisoniades tages*, *H. malvæ*, and *Euchloë cardamines*.

My first day on the mountains proper, the 16th, found me on the old familiar Steinenthal ground, where again everything was conspicuously backward. *Brenthis pales*, usually in swarms, occurred but singly. *Colias phicomone*, afterwards common enough, was also scarce. But I managed to bag a couple of *H. andromedæ*, which I regard as a more or less rare "skipper"; some magnificent forms of *L. arion* var. *obscura*—I have a female in perfect condition, measuring more than two inches in expanse; and, what I think is generally not common in the higher slopes, some good *L. alcon*. The Steinenthal produced a couple of small females, which I daresay should be classed var. *monticola*, Stgr., and almost every day I was out I managed to box a solitary example of the same species, many of the males being quite as large, if not as brilliant, as those which I saw at Biarritz. Such a paucity of Erebias I have never found on the Alps. With the single exception of *E. ceto*, including two or three var. *obscura*, Rätzer, and one fine ab. *pallida*, Tutt, no one was really plentiful about Berisal, even *E. var. cassiope*, and more notably *E. melampus*, being comparatively few and far between. Higher up, *E. gorge* occurred sparsely on the rocks, and *E. lappona* was fairly common, but almost invariably crippled or crumpled hopelessly; some specimens I took quite fresh having no more than three wings, others showing failure of wing pigment, or imperfectly developed nervures—very shabby fellows all and sombre of hue, not to be compared with the brilliantly banded *lappona* (var. *pollux*) I took in Lapland last year. Under the Wasenhorn I also found a fresh pair of *Pontia callidice*, but at this time the snow was barely melted, the yellow sulphur anemones still in full flower, and all other Alpine plants hardly yet developed. I do not remember to have seen a single *E. stygne* in the week I

was at Berisal, usually one of the commonest of its tribe. *E. tyndarus*, even more so as a rule, had evidently not come on; while the higher stages of the road about the Kulm, usually rich in *E. mnestra* and *E. manto*, only produced a sprinkling of the former species on the two days—July 18th and July 21st—when I was collecting on the slopes which surround the Kulm.

The resting habit of *E. tyndarus* is, I think, worth noting. When the sun is obscured it drops on to the ground, appears to creep some little way quickly, and then squeezing in under the herbage, turns flat on its side, when it becomes practically indistinguishable from its surroundings. *Gorge*, on the other hand, seems to prefer the warm side of a rock, or stone, where it lies motionless with outspread wings; while *glacialis* crawls into the interstices of the moraine, from which nothing but the sun's rays will induce it to "break covert."

It was somewhat of a novel experience again to take all three *Parnassiidi* in good condition at the same date. *P. mnemosyne* was still haunting the meadows round the delightful Poste Hotel, which has so far escaped the vulgarization and gingerbread magnificence of lower Switzerland, and remains a haven of peace for the naturalist and all who seek quiet and freedom from the herded tourist. *P. apollo*, hardly common this year, was airing its wings by the roadside; and high up, just below the "Fifth Refuge," where a sparkling stream bubbles out from a mass of golden-flowered sedum, were a few *P. delius* of the female ab. *hardwickii*, Kane. On the rhododendrons above *M. parthenie* var. *varia* was flitting quietly about, the bright Simplon form, though I was fortunate enough to secure one beautiful female almost entirely suffused with black, with those characteristic "blues" of the mountains—*P. orbitulus* and *P. optilete*. On the day when I crossed over to the south side of the Pass, July 21st, *Colias palæno* put in a welcome appearance—a large form of great brilliancy, with the white female, and of these I made quite a decent series, having few in my collection, and none of my own taking from localities other than the Brenner. *Palæno* especially affects the alpine-rose, and once missed invites a gallant chase; *phicomone* prefers the lesser hawkweed bloom. I never remember *Cenonympha satyrion* so rare as this year; but *C. arcania* var. *insubrica* was in perfect condition and very fine in the Berisal region. Meanwhile I was keeping a sharp look-out for *Erebia christi*, as single specimens have been taken, I believe, almost at the top of the Pass opposite the Hospice, and I actually netted *P. mnemosyne* at this unusually high altitude, though I was pretty well sure that I had come too late to the Laquinthal when I unfurled my net in that now famous valley on a magnificent but rather windy day. Here, again, I found the known habitat of this difficult little *Erebia* worn and trodden by

innumerable collectors. The whole of the Geneva Entomological Society had pitched their camp within striking distance a week or so before my arrival. Mr. Lowe, Mr. Wheeler, and other British collectors had reported the species scarce beyond precedent. I met M. Morel, the well-known French coleopterist, also in search. But though apparently he bagged a single specimen, I was less fortunate; and for 1907 the *christi* season was at an end.

My stay at the Fletschhorn Hotel was rather marred by cloudy skies; but remembering the Saasthal side of the Rossboden as a former fine locality for *Erebia glacialis*, I thought I would try the moraine, which now reaches down to the river-bed of the Sengbach, and has completely obliterated the old road. I took the pathless side of the valley to keep in the sun. *Chrysophanus* var. *eurybria*, *Rusticus argyrogynomon*, a form of *Hesperia alveus*—most perplexing of butterflies—and an occasional fine var. *bryoniae* of *Pieris napi* kept me interested over a fatiguing trudge. But alas! when I had attained the required altitude, as so often this summer, I was condemned to see the sun with "gold complexion dimmed"; the cloud and mist swept up, and I thought that my two or three hours' climb would be in vain. Yet there were short, very short, intervals of sunshine, and in these I successfully netted one or two fine specimens of the several *glacialis* borne headlong on the wing over that treacherous sliding detritus, including one "all black" ab. *pluto*. And these, with a single female *mnestra*, always the rarest sex, made up the captures of a long and exceptionally cold day (23rd) for mid-July.

Finding the weather unpropitious, and for other reasons non-entomological, I left Simplon on the 24th, returning to Brigüe after an interesting drive to Iselle, through the great tunnel. The morning of the 25th broke doubtfully; low clouds were hanging over Bel Alp, and the atmosphere was of the Turkish bath order. When I arrived at Fiesch in the diligence, however, the sun was out, and the sides of the Furka Road, which from Brigüe onwards suggest an excellent ground, were enlivened by a fresh brood of *M. didyma* and some very fine *Satyrus cordula*, all males, a species which occurred right up the Binnenthal, my present objective, and even as high as 4800 ft. at the village of Heiligkreuz. Binn itself retains something of the pleasing and primitive Switzerland with which we were familiar some five-and-twenty years ago. There is no carriage-road through this impressive valley, with its lonely forests and sheer ironstone cliffs; beyond Binn and to the Albrun Pass the path is little more than a mule-track in places, and looked therefore all the more promising. But, whether it was the season or the locality, butterflies were decidedly scarce on all the excursions I made, and I met with few species not already

encountered on the Simplon. *Aporia crataegi*, however, was common enough in the uncut Alpine meadows, and on the Eggerhorn, at about 5000 ft., I was surprised to find *Parnassius mnemosyne* still in very fair trim with *Colias phicomone*, *Argynnis aglaja*, and *A. adippe*. The higher grass-slopes were almost barren. I looked in vain for the usual hordes of *Cænonympha satyrium*, only occasional specimens were flying; but just above the one spring of the whole walk I was fortunate enough to net a worn female *L. alcon*. Liberated from the net she at once settled down to a minute plant of *Gentiana* (? species), and obliged with one or two ova, which I sent home, *in situ*, to Mr. Hugh Main. He handed them to Mr. A. E. Tonge, who has kindly allowed me to reproduce his photograph of these very beautiful eggs, also those of *Z. var. lycidas* discovered by me on the leaves of *Astragalus exocarpus* at the "Second Refuge" (Plate V.). Of the "blues" generally, however, here as elsewhere, there was an unusual dearth; *P. orbitulus* alone appearing in any quantity, with a few *Z. var. aegidion*, *L. arion* var. *obscura*, and *P. eumedon*.

After a wet day I now set to work to explore the neighbourhood systematically, but the fine days as often as not were marred by a very high wind, while everything was exceptionally backward in the higher regions. The Albrun Pass (7910 ft.), a fine walk ending in a good deal of rocky débris with some snow, should have shown sport among Erebias. But with the exception of a few worn *E. gorge* of an undistinguished form, and some perfect *Melitaea aurinia* var. *merope* by the wayside, there was again little of note, save that *E. lappona* was here even in more deplorable plight than at Berisal. I did a little better on the several stages that lead up to the Ritter Pass, where the cows, however, had rather spoilt the grassland. On July 27th and again on August 2nd, *Anthrocera minos* was swarming everywhere; a few *P. optilete* and *N. semiargus*, the small mountain form, turned up among the rhododendrons, where again I found a few exceedingly wary *Colias paleno* with one white female snapped off a hawkweed flower. *Vanessa io* was also coming on, and *Brenthis pales*, generally the commonest of insects at this elevation, in some numbers. I also took one very worn *Melitaea cynthia*, which puzzled me considerably, inasmuch as on the Collinhorn on August 1st I had taken two very fresh males—the only specimens worth bagging of this pretty fritillary seen at all. There also I met with a single *Erebia pharte*, a couple of *L. alcon*, and some four *L. arion* var. *obscura*; but even *E. tyndarus* was rarely met with. So that I am inclined to agree with Mr. Fison's conclusions, published elsewhere, that Binn for Erebias is not a favoured locality. Ten days' hard work, indeed, added little either to my store-boxes, or to my knowledge of the genus.

Leaving Binn on August 5th, I thought I would try the country round Vallorbes on the frontier from which on so many

early mornings of travel I had gazed from the train window. Ballaigues looked promising in the guide-book. It is about an hour's drive from Vallorbes Station, and situated on the uplands of the Jura, which, well-forested, culminate at this point in Mont Suchet (5236 ft.). But I was not lucky in the two days I could give to collecting, though I fancy at this time of the year the locality is never very productive, again owing to the depredations of the dairy cow. Mont Suchet looms large in the expeditions of the older generation of entomologists. It is but a grass-walk from Ballaigues, and only in the woods under the crest of the hill did I find any butterflies at all. *Cœnonymphia iphis* (one female) was over, but *Chrysophanus virgaureæ* was freshly emerged, with *Brenthis ino*, *Erebia ligea*, and, higher up, *E. pronoë* var. *pitho*. Lower down, rather worn *Polyommatus damon* still fluttered among the sainfoin in the meadows, and *Pararge egeria* var. *egerides* was not infrequent in the glades near the hotel. On the slopes near the village *Parnassius apollo* was also in first-rate condition, of the conspicuous form which I had met with earlier in the season at Éclépens. I much regretted, however, that I had not crossed to the French frontier, for though Pontarlier itself is not more promising than Vallorbes, I should think the intervening country, and especially in the neighbourhood of Jougne, would be worth investigating. Bruand, who wrote his 'Catalogue of the Doubs' in "the forties," makes a brave show of butterflies for the district; and apparently it has not changed much, except round the little busy frontier town, which is the gate of France. Indeed there, and northward along the Juras, past Belfort and into the French and German Vosges, there is a fine country, apparently unknown to recent entomologists, who content themselves year by year with the familiar treasures of "the playground of Europe."

Harrow Weald: October, 1907.

OBSERVATIONS ON THE SPECIES OF THE GENUS
CALLIMENUS, FISCHER DE WALDHEIM (ORTHOPTERA,
BRADYPORIDÆ).

By A. M. SHUGUROFF (Odessa).*

AMONG the orthopterological material collected by A. A. Brauner in June, 1905, in the valley of Manuich, near the village of Veliko-Kniazheski, in the south-eastern corner of the province of the Don Cossacks, I found a new species of the genus *Callimenus*, Fisch. de W. It is in honour of A. A. Brauner,

* (From the 'Revue Russe d'Entomologie,' 1906, Nos. 3 and 4, pp. 176-183. Translated from the Russian by Malcolm Burr.)

who has done much for the investigation of the fauna of the southern zone of Russia, that I take the pleasure of naming this species.

Callimenus brauneri, Shug., n. sp.*

♀. Tota splendens. Pronotum postice dilatum, fortius emarginatum, disco postice supra utrinque plicis 4 (1 magna, 1 parva). Lobi mesosternales latitudine vix vel haud longiores, apice magis acuminati; lobi metasternales angusti, latitudine longiores, subparallelis, apice ipso subacuti. Abdomen dorso utrinque plica 1 magna. Cerci ♀ conici, acuminati. Lamina subgenitalis ♀ rotundata, apice excisa. Pronoti lobi deflexi lăves.

♂ colore non differt a ♀. Cerci cylindrici, rotundati. Lamina subgenitalis margine subrecto, integro, bicarinata.

| | ♀ | ♂ |
|------------------------|------------|--------|
| Longitudo corporis: | 55 mm. | 55 mm. |
| „ pronoti: | 17.5 mm. † | 19 mm. |
| „ femorum posticorum: | 18 mm. | 18 mm. |
| „ tibiarum posticarum: | 23 mm. | 23 mm. |
| „ ovipositoris: | 15 mm | — mm. |

Ciscaucasia septentr. districtus Velikoknajzheskensis provinciae Exercitus Donensis (specimen unicum ♀ mihi ab A. A. Brauner donatum et ei dedicatum); districtus Rostov-Donensis ejusdem provinciae. Donensis (specimen unicum ♂ mihi a Dom. Sarandinaki donatum). (♂, ♀ in coll. mea.)

Callimenus brauneri, Shug., is generally related to *C. montandoni*, Burr, for which I at first mistook it (the female of that species was at that time unknown to me, *vid. inf.*). But Mr. Malcolm Burr, to whom I submitted my specimen for examination, pointed out to me the characters which distinguished my species from *C. montandoni*.

C. brauneri is distinguished from its congeners by the shining metallic colour of the whole body. The head is black, with a dirty brown shade on the frons, cheeks, and mouth-parts; the pronotum is rugose, with brown markings, and behind with a rather deep (up to 1.5 mm.) triangular incision, and four tubercular folds on the slightly swollen posterior portion, of which the middle pair is large and the outer pair small, and side flaps smooth, slightly compressed anteriorly, coffee-brown, with black-marked impressed spots in the general red-bronze sheen. The lower part of the side flaps is almost straight, rounded posteriorly and slightly reflexed, together with the corners of the pronotum. The lobes of the mesosternum bright yellowish brown, slightly

* In my article, "A Few Notes on Orthoptera" (Rev. Russe d'Ent. vi. p. 22 (1906)), this species is referred to under the name of *Callimenus restrictus*, F. de W. This species was so insufficiently described by Fischer de Waldheim that we may safely regard it as a *nomen nudum*.

† Differentia latitudinis pronoti antice et postice fere 4 mm.

| | <i>C. oniscus</i> , Charp. | <i>C. longicollis</i> , Schul. | <i>C. dilatatus</i> , Stål. | <i>C. montandoni</i> , Burr. | <i>C. brauneri</i> , Shug. |
|---------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|---------------------------------|----------------------------------------------------------------|--------------------------------------------------------------|
| Pronotum, ♂ | parallelum | parallelum | postice inflatum | postice dilatatum | postice dilatatum |
| Pron. margo post..... | vix emarginatus, ♂ ♀ | etiam minus emarginatus, ♂ ♀ | — | ♂ fort. ♀ min. emarginatus | ♂ fortius emarginatus |
| Pron. margo Post-
supra utrinque | pliata 1 magna | pliata 2 magnis | — | pliata 2 magnis | pliata 1 magna, 1 parva |
| Lobi mesosternales | triangulares, haud longiores quam basi lati, spicis subrotundatis | longiores quam lati, apice acuti | breves, horizontaliter producti | haud longiores quam lati, apice obtusi | vix, vel haud longiores quam lati, apice obtusi |
| Lobi metasternales ... | triangulares, obtusis, longiores quam basi lati | triangulares, haud longiores quam basi lati, obtusis | — | obtusi, apice rotundati, haud vel vix longiores quam basi lati | angusti, longiores quam lati, subparallelis, apice ipso sub- |
| Abdomen, segm. dor-
salia utrinque | pliata 1 magna | pliata 1 magna | bus | obtusi, apice rotundati, haud vel vix longiores quam basi lati | acuti |
| Cerci, ♂ | cylindrici, rotundati | conici, acuminati | dichotomis | cylindrici, rotundati | pliata 1 magna |
| Cerci, ♀ | conici, acuminati | subrecte, integræ, bi-
carinata | spicis acuto-
obtusi | conici, acuminati | cylindrici, rotundati |
| Lamina subgenitalis margin poster., ♂ ... | subrecte, utrinque paucolite marginata | subrecte, integræ, bi-
carinata | ampissima, late emarginata | conici, acuminati | conici, acuminati |
| Lamina subgenitalis margin poster., ♀ | bicarinata | carinata | carinata | subrecte, integræ, bi-
carinata | subrecte, integræ, bi-
carinata |
| Pronoti lobi deflexi .. | exissa | late sinuata, angulis acutis | ampia, rotundata | rotundata, rotundato-
excisa | rotundata, apice ex-
cisa |
| Longitudo pronoti, ♂ | leaves | leaves | leaves | leaves | leaves |
| Longitudo pronoti, ♀ | 17-20 | 15 | 19 | 19 | 19 |
| Long. " femor. post., ♂ | 15-16 | 16-17 | 16-5 | 17-5 | 17-5 |
| Long. " femor. post., ♀ | 20-25 | 18-5-23 | 19-19-5 | 18 | 18 |
| Long. femor. post., ♂ | 20-24 | 20-23 | 20 | 18 | 18 |
| Long. tibiarum post., ♂ | 80 | 28 | 26-26-5 | 23 | 23 |
| Long. tibiarum post., ♀ | 26 | 26-5 | 26-5 | 23 | 23 |

longer than broad, pointed at the apex; lobes of the metasternum narrow, elongate, parallel and pointed at the apex itself. Abdomen on the back and sides black, with a light shot-bronze shading; on both sides of the middle line there is a row of large tubercular folds. On the first dorsal segment between the first and the third small black tubercles there is a small yellow spot which surrounds the second tubercle with a radius equal to the distance between the first and second segment. On the second segment the spot occupies a space of the same width, but extending from the anterior to the posterior margin of the segment; beginning with the third segment, and continuing as far as the eighth; between each first and second and third small tubercle there is a small yellow spot not fused with the neighbouring spot of the same segment. On the ninth segment the spots coalesce; on the tenth the tubercles disappear, and there remains a scarcely perceptible little yellowish spot. The under side of the belly is bright greyish yellow, the first and second ventral segments with a brown marking.

The subgenital lamina of the female is rounded, with a fairly deep emargination on the apex, without teeth (thus differing from *C. pancici*, Brauner); the cerci (female) are short, conical, and pointed.

The male does not differ from the female in colour, and the cerci are cylindrical, without teeth on the inner side. Subgenital lamina slightly raised, with two keels.

(To be continued.)

NOTES ON BRITISH BRACONIDÆ. V.*

By CLAUDE MORLEY, F.E.S., &c.

MACROCENTRIDÆ.

THE species of this small family are very familiar insects of fair size and gregarious habits, as many as a hundred occasionally emerging from a single large lepidopterous larva. The pale species of *Zele* strongly resembles small *Panisci* or large *Meteori*, from both of which the sessile abdomen and neuration will at once distinguish them; while *Macrocentrus marginator* appears superficially allied with the *Lissonotid* *Pimplinæ*. The two European genera are known by:—

Occiput not bordered; first segment not longer than second

MACROCENTRUS.

Occiput bordered; first segment much longer than second ZELE.

* Cf. Ent. Mo. Mag., 1906, p. 106 (Bracon); Entom., 1906, p. 99 (Microgasteridæ); Entom., 1907, p. 179 (Cryptogastres); and Entom., 1907, p. 217 (Agathidiidæ).

MACROCENTRUS, Curt.

- (6) 1. Palpi elongate; antennæ at least 45-jointed.
- (3) 2. Labial palpi with third joint not reflexed,
body black 1. *marginator*, Nees.
- (2) 3. Labial palpi with third joint reflexed;
body not entirely black.
- (5) 4. Second discoidal cell nearly one-third
shorter than the first 2. *thoracicus*, Nees.
- (4) 5. Second discoidal cell hardly shorter than
the first 3. *abdominalis*, Fab.
- (1) 6. Palpi short; antennæ at most 87-jointed
- (8) 7. Second abscissa of radial nervure as long
as the first transverse cubital 4. *infirmus*, Nees.
- (7) 8. Second abscissa of radial much shorter
than the first transverse cubital 5. *collaris*, Spin.

M. marginator.—A very abundant species in all marshy spots in May, August, and September, on the flowers of *Angelica sylvestris* and *Lysimachia vulgaris*. I have found it at Herringswell Fen, Barton Mills, Barnby Broad, Claydon, Brandon, Tuddenham Fen, Monks Soham, Ipswich, Finborough Park, Henstead, and Benacre, in Suffolk, often by general sweeping and sometimes after dark; as well as at Metton and Ringstead, in Norfolk; and possess it from Tostock (Tuck); Isle of Arran (Waterston); bred at Lincoln (Musham); Abinger Hammer, Surrey (Butler); Felden, in Herts (Piffard); Whitby (Beaumont); Richmond Park (Bedwell); Guestling, in Sussex, in 1877 and 1888 (Bloomfield); Possil Marsh, Scotland, in 1899 (Dalglish); Point of Aire, in 1904 (Tomlin); Greenings, in Surrey (Wilson Saunders). Mr. Whittle bred it in a breeding-cage containing pupæ of *Sesia cynipiformis*, at Southend, May 21st, 1900; Mr. Thornhill from *Sesiæ* sp. at Boxworth, Cambridgeshire, June 21st, 1902; Col. Partridge from *S. culiciformis*, at Blackheath, May 23rd, 1899; Mr. Mason from *S. asiliformis*, at Caister, Lincolnshire, July 10th, 1905; and Mr. Charbonnier from *S. tipuliformis*, at Bristol, in May. Two males and a female emerged early in the morning of May 18th, 1901, from pupæ of *S. culiciformis*, from near Balmoral, Aberdeenshire; a male and female paired about 7.30 a.m.; when I received them from Mr. James Duncan on the 17th the males were both dead, but the female alive. In 1907 it has been common in August and September, on flowers of *Heracleum* and *Angelica*, at Monks Soham, Depden, and Southwold, in Suffolk.

M. thoracicus.—Not very common; I have only once beaten the male from birch-bushes in Assington Thicks, Suffolk, July 23rd, 1902. Elliott has taken it at Ilkley in Yorkshire; Capron at Shere, in Surrey; Piffard at Felden, in Herts; W. Saunders at Greenings, near East Grinstead; and Platten at light, in Ipswich, September 30th, 1899. Porritt bred a female from an unknown

Noctuid in 1897, and I have found the female flying about a cluster of fungi growing on an old stump, at the end of September.

M. abdominalis.—An abundant species, though more usually bred than taken abroad. I have swept it from reeds at Foxhall, Brandon, and in the Bentley Woods, in Suffolk, in August and July; both sexes occurred in my garden in August, 1907; Mr. Tuck has taken it at Tostock and Benacre Broad, in the same county; Mr. Butler at Abinger Hammer, in August; Mr. Piffard at Felden; Mr. W. Saunders at Reigate; and Beaumont at Plumstead and Blackheath. The sexes are, I believe, invariably bred separately; Mr. Platten bred four males from *Chelonia caja* at Ipswich, July 24th, 1899; Mr. Peachell bred nine females from a larva of the same species at Weymouth, July 27th, 1899; Mr. Musham bred twenty females on August 30th, 1901, at Lincoln, from *Spilosoma* sp.; Mr. Bankes bred eight females at the beginning of July, 1905, "from among a mixed lot of micro-lepidopterous larvæ feeding on oak, collected at Yarmouth, Isle of Wight. Host uncertain (probably *Rhodophæa consociella*, Hb.)"; and I have thirty females which emerged from a dead green Pyralid larva feeding on birch; their larvæ emerged from the host June 23rd, 1905, and became imagines on the 6th of the following June, from Tonge. Donisthorpe found this species in Kerry, in 1902.

M. infirmus.—Rare on the wing; I have only once caught it, by sweeping in an osier carr at Barton Mills, in Suffolk, June 18th, 1901, and Mr. Tuck found it at Aldeburgh, September 16th, 1899; Dr. Capron at Shere, Mr. Piffard at Felden, and Mr. Beaumont at Blackheath and Harting, in Sussex, in August. The sexes are bred separately. Mr. Bankes bred fifteen males from their cocoons, which emerged from a larva of *Retinia sylvestrana*, Curt., from the Isle of Purbeck, Dorset, July 18th, 1902; and Mr. S. Kemp has given me a huge bundle of their cocoons, together with the emerged imagines, of which I can count about one hundred and five specimens—all females—upon the surface of the bundle, "bred from a larva found on a sandhill, North Bull, Dublin, June, 1902" (received October 15th, 1902). I took a male on *Plantago major* in my garden, August 27th, 1907.

M. collaris.—Not uncommon, though I have seen no bred specimens. Both sexes at Felden (Piffard); four females at Greenings (W. Saunders). I have only taken the latter sex, of which several occurred on the flowers of *Fœniculum vulgare* in a lane at Alderton, in Suffolk, September 3rd, 1899; several at Gosfield, in Essex, July 24th, 1902; one at the roots of *Erodium cicutarium*, at Brandon, in Suffolk, August 26th, 1906; and one at Shalfleet, in the Isle of Wight, June 26th, 1907.

ZELE, Curt.

(2) 1. Radial cell of lower wing entire 1. *testaceator*, Curt.
(1) 2. Radial cell of lower wing centrally discreted.

(4) 3. Body testaceous red 2. *chlorophthalmus*, Nees.
 (3) 4. Body nigrescent 3. *discolor*, Wesm.

Z. testaceator.—Not uncommonly captured and bred, though I have only once met with it, about Ipswich, in 1899. Several males at Felden, in Herts (Piffard); South Leverton in Notts, June, 1896 (Thornley); Reigate in August, 1872 (W. Saunders); bred at Caister, in Lincolnshire, by Mr. G. W. Mason, in 1905, from *Cosmia trapezina*; and from an unidentified larva from Hailsham, in Sussex, in July, 1892, by Mr. G. T. Porritt.

Z. chlorophthalmus.—I only possess one male, given me some years ago by Rev. E. N. Bloomfield, who captured it at Guestling, near Hastings, in 1889.

Z. discolor.—Mr. J. E. Campbell-Taylor sent me a single female of this species, which he had captured in the Cardiff district in 1903.

NOTES AND OBSERVATIONS.

ON REARING *P. PODALIRIUS*.—Like Mr. F. T. Gilliat (*antea*, p. 211), I, too, failed with larvæ from ova collected at Hyères this spring. They fed up well on myrobalan plum; but I did not like the look of some of the chrysalids, and in the end all the specimens that emerged were crippled. However, in my case I attributed failure to the fact that I took my pupæ to Switzerland and back, and they underwent many changes of climate and altitude before they emerged after I returned home at the end of July.—W. H. ST. QUINTIN; Scampston Hall, Rillington, York.

OVA OF *ARASCHNIA LEVANA*.—I caged two female *A. levana* captured at the end of June last in Switzerland, and obtained ova from both. As Mr. Sheldon observes in the last number of the 'Entomologist,' the ova are laid in strings, generally, but not always, pendent from the lower surface of the nettle-leaf. My insects laid batches at intervals, from two to five "strings" in each batch. One insect laid two batches, and the other three. The ova are of a pale green when fresh, and simulate wonderfully the spikelets of the flowers and seeds of the food-plant. It was curious to watch the young larvæ hatching. They manage to leave the shell without breaking the connection between the ova. When all the larvæ have left a "string," the transparent egg-shells still remain attached by their tops and bases, and still pendent from the leaf.—W. H. ST. QUINTIN.

ON REARING THE LARVÆ OF *AGROTIS AGATHINA*.—Barrett, in his 'Lepidoptera,' says, in reference to *A. agathina*, that in confinement it seems almost impossible to bring the larva to maturity, and that, so far as he knows, it must be reared on growing heather in the open air. He quotes Mr. Gregson's directions to the same effect, and several contributors to Tutt's 'Hints' seem to agree with him. My experience is that it is quite easy to rear this insect from very young larvæ swept

from *Erica cinerea* in May, feeding them on cut heather in ordinary breeding-cages, kept in a summer house in the garden, sprinkling the food-plant with water every evening.—F. PENNINGTON, Jun.; Reform Club, Pall Mall, S.W., October 1st, 1907.

CHELIOPTERA (PLATYCLEIS) ROESELII, &c., AT HERNE BAY.—During a visit to Herne Bay last month I noticed a number of grasshoppers on a sunny grassy hillside in the neighbourhood. I caught a few specimens, and found one of them to be a female of *Stenobothrus elegans*. Not being prepared for entomological work, I could do nothing more at that time. Two days later (September 13th), however, I returned to the same district better equipped. I then took *S. elegans* sparingly and *S. parallelus* plentifully, but the event of real interest was the capture of a female of the rare grasshopper, *Chelidoptera (Platycleis) roeselii*, Hagenb., a species which had been previously recorded from Herne Bay, but seemingly from only one other undoubted British locality. Notwithstanding a prolonged search, no further specimens were met with, and I had no later opportunity of renewing the search.—HERBERT CAMPION; 38, Maude Terrace, Walthamstow, October 14th, 1907.

NOTE ON OPOROBIA (LARENTIA) AUTUMNATA.—It is a long time since I have had the pleasure of taking the above insect. It used to occur freely in birch woods in North Durham. As I knew that it occurred in this (Cleveland) district on alder, I was able to beat some larvæ in June from that tree. I thought I had seen the last of the insect for the season, but I was mistaken. In early July I went as usual to beat for larvæ of *P. piniperda* from *Pinus sylvestris*, and amongst the contents of the tray were some peculiar rusty larvæ. The rust was to a slight extent varied with green. I at once suspected that the larvæ were those of an *Oporobia*, but at the same time they more vividly brought to my mind the larvæ of *E. fasciaria*, so little did they resemble ordinary *Oporobia* larvæ, and so great was the amount of red. The red was not in any manner like the purple which very often appears in the larvæ of both *O. dilutata* and *O. autumnata*. It evidently owed its origin to the same cause as the red of *E. fasciaria* larvæ, *i.e.* an attempt to imitate the red terminal bud of the pine shoots. Passing from pines to larches, I beat similar larvæ from the larch. As at that time I was unwell, I was unable to describe the larva as minutely as I wished. Although, as stated, I suspected at the time that the larvæ were *O. dilutata*, so curious was their coloration I determined, in spite of illness, to rear them. I did so, and was rewarded by breeding in the last week of September some undoubted specimens of *O. autumnata*. When these emerged I went for wild specimens, and was successful. In one case, about 3 p.m., I observed one specimen, with wings unexpanded, crawl out of the débris about ten inches from a larch-trunk, climb a grass-stalk, and there rest until its wings were dry. It proved a very dark specimen, but still *O. autumnata*. As all the specimens had the shining appearance supposed to have been acquired in *O. autumnata* from resting on birches, this supposition must be fallacious. The nearest birches are about a mile away, and there, owing to the swampy nature of the ground, no specimens of *Oporobia* occur—at least, I have never beaten

their larvæ nor have I taken the moth, although I have looked at the proper times. I was discussing the subject with Mr. T. A. Lofthouse of this town, and he told me he had long suspected that this insect was a larch and pine feeder. In conclusion, I should like to point out that the elevation of the wood in which the insect occurs is from 600-800 ft. above sea-level.—J. W. H. HARRISON; 181, Abingdon Road, Middlesbrough.

A NATURAL HISTORY OF THE BRITISH BUTTERFLIES.—We have just received from the publisher, Mr. Elliot Stock, Paternoster Row, London, E.C., eleven parts of volume ii. of this comprehensive work by Mr. J. W. Tutt. The first part of this volume was issued on February 15th, 1907, and part xi. on July 20th. In the introductory chapters, pp. 1-48, the subjects discussed are Æstivation and Hybernation, the Gregarious Habit, and the Family Habits of Butterfly Larvæ. The five species of "hairstreak" butterflies occurring in Britain are next considered, and these the author refers to the three tribes into which he divides the subfamily *Ruralinæ* (*Theclinæ*) of his *Ruralidæ*; the whole being embraced in the superfamily *Ruralidæ* (*Theclides*). In the first tribe *Callophryidi*, *Callophrys* (*Thecla*) *rubi*, L., is the only species, occurring in the palæartic region, referable to it, although some North American species probably belong thereto. The tribe *Strymonidi* comprises *Edwardsia* (*Thecla*) *w-album*, Knoch, and *Strymon* *pruni*, L.; whilst *Bithys* (*Zephyrus*) *quercus* and *Ruralis* (*Zephyrus*) *betulae* are included in the tribe *Ruralidi*. When it is stated that an average of some forty-five pages is occupied in dealing with each species, in its perfect and early stages, it will be understood that the treatment is of the elaborate character the author has accustomed us to in his previous volumes on Lepidoptera. Even such details as the time of appearance of the imago, British localities, and distribution abroad are set out at great length. Under *Callophrys rubi*, for example, these matters alone run into about thirteen pages. Altogether there are in the eleven parts 344 pages, and four (? five) plates. The latter are capital reproductions of photographs of eggs of the *Ruralides*, life-history of *Callophrys rubi*, and pupal hairs, &c.

CAPTURES AND FIELD REPORTS.

ENNOMOS AUTUMNARIA AT ASHFORD, KENT.—Early in the morning of October 3rd last I picked up from the pavement in Ashford a male specimen, in very fair condition, of *E. autumnaria*.—D. CHITTENDEN; 14, Limes Grove, Lewisham, S.E.

LEUCANIA VITELLINA IN KENT.—Whilst spending a few days collecting with Mr. E. D. Green, I have had the pleasure of taking a few *L. vitellina* in East Kent.—WALTER DANNATT; Vanbrugh Park, Blackheath.

MOTHS AT LIGHT.—It is true that from one cause and another I have had very little opportunity for collecting Lepidoptera during the past season, but so far as I was able to do so, I must say that I never remember a worse one for these insects. A visit to the street-lamps one evening in May (28th) yielded the following:—*Euchelia jacobæa*,

Drymonia (Notodonta) chaonia, *Spilosoma menthastris*, *S. lubricipeda*, *Pygæra bucephala*, *Dicranura vinula*, and other common species.—JOSEPH ANDERSON; Chichester.

COLIAS EDUSA.—This species having been unusually scarce this season, I was much surprised to find a female at rest on a thistle about 10 p.m. on the 5th inst.—EDWARD GOODWIN; Canon Court, Wateringbury.

DRAGONFLIES NEAR HUNTINGDON.—During recent visits to Hartford, near Huntingdon, I have collected from the River Ouse at that place examples of the following species of Agrionidae:—In 1904 (June 17th), *Calopteryx splendens* (one male); in 1906 (June 18th to 30th), *C. splendens* (one male), *Pyrrhosoma nymphula*, *Ischnura elegans*, and *Agrion puerilla*; and in 1907 (June 24th to July 6th), *C. splendens* (males and females), *Platycnemis pennipes* (one very immature male, with reduced spots), *Erythromma najas* (one very immature male), *I. elegans* (including a female of var. *infuscans*), *A. pulchellum* (one male), and *A. puerilla* (including a male having the U-shaped spot joined to the circlet behind).—F. W. CAMPION; 33, Maude Terrace, Walthamstow, Essex.

CAPTURES OF LEPIDOPTERA IN CAMBRIDGESHIRE, &c.—I should like to record a few of my recent captures, some of which are as follows:—*Apophryla nigra*, Hw. Cambridge, at light, September 25th, 1907. I doubt if this has been taken here before.—*Orthosia ocellaris*, Bork. A specimen on a Cambridge lamp, September 16th, 1907.—*O. gilvago*, Esp. Very common here this year. I have seen as many as seventy in one night, and ten on one lamp.—*Heliothis dipsacea*, L. Cambridge, at light, July, 1907; Wicken Fen, at light, August 9th, 1907.—*Hadena ophiogramma*, Esp. One at Shelford, Cambridgeshire, June 20th, 1906.—*Deilephila livornica (lineata)*, F. One at Shelford, August 3rd, 1905, hovering over lavender.—*Stauropus fagi*, L. An imago, Gog Magog Hills, at rest on palings, July 5th, 1907.—*Homæosoma sinuella*, F. This species seems common in wild places on chalky soil all over the district. Is it still reckoned a coast species?—*Evergestis extimalis*, Sc. Two at light, Cambridge, July, 1907.—*Pammene ochsenheimeriana*, Z. Devil's Ditch (Newmarket), May, 1905; Cambridge, June, 1906.—*Parasia neuropterella*, Z. Barton Hills (Bedfordshire), August 22nd, 1907.—*Aristotelia lucidella*, Stph. Swarmed in one corner of the lake in Epping Forest, August 2nd, 1907.—*Mompha stephensi*, Stt. Richmond Park, September 5th, 1907.—*Nepticula fulgens*, Stt. Shelford, Cambridgeshire, 1907. (Common, together with *N. tityrella* (?).)—*Ochsenheimeria vacuella*, F. R. Common on oak-trunks (in crevices of the bark), September 5th, 1907. Most of them were in bad condition, many dead and dry.—Mr. A. G. Wilmott, of St. John's College, Cambridge, asks me to mention the following:—*Orthosia xerampelina*, Hb. Ten at light, Cambridge, September, 1907.—*Senta maritima*, Tausch. One at light, Cambridge, August, 1907.—*Loxostege palealis*, Schiff. One at light, Cambridge, August, 1907.—*Chrysoclista linneella*, Cl. Locally common at Cambridge this year.—Not being acquainted with a more up-to-date work, I have used the nomenclature of Meyrick's 'Handbook.'—F. W. EDWARDS; Penwith, Hills Road, Cambridge, October 6th, 1907.

their larvae nor have I taken the moths proper times. I was discussing the moths of this town, and he told me he had seen a larch and pine feeder. In view of that the elevation of the wood is about 600-800 ft. above sea-level. — 100, Road, Middlesbrough.

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rest Mr. in March for some time must be a J. J. Walker, of the Straits of Malacca, has thoroughly examined, but I can mention species not seen by Miss Fountaine, or earlier than mid-July; I confused it with *Epinephele*, it occurs at the end of the month, is scarcely to be seen in *S. briseis*, *S. arethusa*, *S. lachesis* in March or April at the latest, too, that Mr. Sowerby (*Callophrys*, Hübner), for *M. lachesis* (*Callophrys virgaurea* has not hitherto been seen var. *miegii*, Vogel, according to the central regions. Perhaps an amendment as to date; no record; Oxhey Grove, Harrow

SOCIETIES.

Meeting of the Royal Entomological Society at London.—Wednesday, October 2nd, 1907. Mr. J. A. D. Perrins, President, in the chair.—Mr. J. A. D. Perrins, Mr. Frank Milburn Howlett, of Calcutta, and Mr. Frank Milburn Howlett, of Pusa, Bengal, India, were elected Fellows of the Society. Mr. J. D. Morice gave an account of his reception into the Royal Society, and of the celebrations at the Royal Society, and at the Academy of Science of Stockholm, at which Commander J. J. Walker showed living

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discovered by Mr. A. H. Hamm, of the Oxford University walls in the vicinity of Oxford inhabited by the Mason wasp *Apanteles (Aulacidea) pilipes*, on which it is parasitic in its larva. Mr. G. T. Porritt exhibited black specimens of both species, the first record from the Harden Moss Moors, Huddersfield, showing the melanistic tendency of Lepidoptera in the district.—Mr. J. D. Doherty exhibited *Apion semivittatum* taken on *Mercurialis annua* at Duthie in August and September 1907; *Magdalis duplicata* from Nethy Bridge in July 1907, the first record of the species for Scotland; *Horiston anguinea* from Aviemore and Nethy Bridge in July 1907, the first record for Scotland; and *Piezostethus formicetorum*, taken with *Horiston* at Bannoch, in July, a species which has not been

since Dr. Buchanan White first captured it at —Mr. A. H. Jones brought for exhibition a case of this year from Herculesbad, South Hungary, including *rebia melas* from the Dogmed, remarkable in their *Erebia alecto* var. *nicholli*, Oberth., from Campiglio, and Oberth., also shown for comparison by Mr. H. Rowland. Jones also exhibited examples of *Chrysophanus dispar* var. *alciphron* from the neighbourhood of Buda-Pesth; both at size and brilliant colouring.—Dr. F. A. Dixey exhibited from Uganda of the African Pierine genus *Mylothris*, showing complete gradation between *Mylothris chloris*, Fabr., and *o. Cram.*—Mr. M. Jacoby showed several fine forms of the *Calligraphus ab. ceronus* taken this autumn at Folkestone, including a male of the ab. *cinnides*, Stgr.—Mr. Norman Joy exhibited a male of the rare beetle *Cryptophagus subdepressus*, Gyll., taken near Ross, on August 4th last.—Mr. W. J. Lucas showed on behalf of Mr. Nicholson and Mr. Summers two specimens of *Deilephila elpenor* bred by them from larvae found in Kew Gardens; also several examples of predaceous insects with their prey.—Mr. H. M. Edelsten exhibited specimens of *Sesia andraniformis*, bred from pupæ taken in Bedfordshire and Kent, and ova of *Nonagria canna*; describing its remarkable methods of oviposition.—Mr. A. Harrison and Mr. H. Main exhibited four broods from females of *Pieris napi*, var. *bryoniae*, captured on the Kleine Scheidegg Pass, Switzerland, in July 1906, showing a wide range of variation.—Prof. T. Hudson Beare exhibited a specimen of the rare bug *Lygaeus equestris*, Linn., from St. Margaret's Bay; examples of *Hypera tigrina*, Boh., taken in some numbers on the wild carrot at the same locality—a very local insect, which seems to be confined to the extreme south-east corner of England; and specimens of *Apion semivittatum*, Gyll. off plants of *Mercurialis annua*,; all taken during August and September at St. Margaret's Bay.—Col. Charles Swinhoe, M.A., F.L.S., read a paper on "The Species of Hesperiidæ from the Indo-Malayan and African Regions described by Herr Plotz, with some new Species."—Lieut.-Col. Neville Manders, R.A.M.C., read a paper on the "Butterflies of Mauritius and Bourbon."—Dr. T. A. Chapman, M.D., F.Z.S., read a paper on "The Hybernating Habit of the Lepidopterous Genus *Marasmarcha*," and exhibited specimens to illustrate his remarks.

October 16th, 1907.—Mr. C. O. Waterhouse, President, in the chair.—Mr. P. H. Jackson, of 112, Balham Park Road, was elected a Fellow of the Society.—Mr. A. H. Jones exhibited a series of *Pieris napi* var. *bryoniae*, from comparatively low altitudes, taken in June last at Peszer, near Buda-Pesth, showing a wide range of variation; and a remarkable aberration of *P. napi* (*napeæ*) bearing a strong resemblance on the under side to *P. rapæ*.—Mr. W. J. Lucas showed for Mr. M. Burr an example of *Apterygida albipennis*, discovered by him near Dover this year, and a male specimen of *D. verrucovirus*—an inhabitant of Scandinavia—from the same locality. He also showed, for Mr. H. Campion, *Platycleis roselii*, Hagenb., female, taken September 13th, 1907, near Herne Bay; and for Mr. E. W. Campion an aberrant form of *S. sanguineum*, male, from Epping Forest; and two

Calopteryx virgo of his own from the New Forest showing failure in pigment.—Mr. W. J. Kaye exhibited specimens of *Callicore aurelia*, Guen., together with a photograph of its larva, showing the remarkable branch-like horns rising out of the head. The whole life cycle is but nineteen days.—The Rev. F. D. Morice exhibited, side by side, a normal male specimen of the bee *Anthidium manicatum*, L., and a monstrosity or malformation of the same insect, which was given him by M. Vachal, of Argentat, Corrèze, France.—Dr. T. A. Chapman said this malformation had clearly no causation in any larval injury, but dated from an early period of embryonic life.—The President exhibited a living ant, a species of *Camponotus*, which had been found by Mr. Watson at Kew, in a pseudobulb of an orchis (probably a *Bulbophyllum*) from the Gold Coast. The bulb was much excavated, but it had no opening by which the ant could have entered. He also showed a large wasp (a *Salius* allied to *dedjax*) with a spider, a *Mygale* rather larger than itself, but which it had captured and was carrying off. These were from German E. Africa.—Lt.-Col. Neville Manders exhibited a melanic variety of *Hestina nama*, captured near Darjeeling; and a monstrosity of *Papilio krishna*, from Sikkim, in which the wings on the right side were much larger than those on the left.—Mr. H. Main exhibited the larva of a hymenopterous parasite of *Pygæra bucephala*, of great size compared with its host.—The President announced that the Council had decided in favour of holding a Conversazione at some date next year to be fixed by a Committee of Fellows elected for the purpose of organization, and the Secretary gave some account of what it was hoped the Society would be able to do in the way of exhibits, &c.—H. ROWLAND-BROWN, M.A., Hon. Secretary.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—
September 12th, 1907.—Mr. Hugh Main, B.Sc., Vice-President, in the chair.—Mr. South exhibited specimens of *Lithosia caniola*, bred from larvæ fed upon lettuce, which they seemed to prefer when in a decaying condition.—Mr. Newman, a few bred specimens of *Eugonia autumnaria*, including two very beautiful dark fuscous forms, the result of a pairing of the unique form bred last year with a typical form. He also showed varieties of *Aglaia urticae*, including forms with black hind wings, rayed hind wings, and with discal spots almost obsolete.—Mr. Goulton, living larvæ of *Banksia argentula*, and a series of *Anticlea badiata* showing much variation in the transverse banding and general coloration.—Mr. Harrison, imagines of the same species from Wicken, together with living larvæ.—Mr. Sich, imagines and ova of *Trifurcula immundella* from Surrey, and read notes on the habits of the imagines and larvæ, and giving the characteristics of the ova.—Dr. Chapman, bred specimens of *Arctia fasciata*, from ova obtained by him in Spain.—Mr. Main, a long series of photographs of the life-history of *Charaxes jasius*.—Mr. Tutt read a paper, "Egg-laying of the Brenthids," and a considerable discussion took place.

September 26th.—Mr. Hugh Main, B.Sc., Vice-President, in the chair.—Dr. G. C. Hodgson, of Redhill, was elected a member.—Mr. Tonge exhibited a living larva of *Cucullia asteris* from Sussex, and

showed some stereographic views he had made of insects at rest.—Mr. Ashby, series of *Donacia crassipes* from the New Forest, *D. clavipes* from Wicken, and *Hæmonia curtisi* from Gravesend.—Miss Fountaine, both sexes of the two broods of *Pieris ergane*, the spring specimens from Montenegro, and the autumn from Herzegovina.—Mr. Newman, a very large number of varieties and forms of the various species bred and captured by him during the present season.—Mr. Simmons, a series of *Hemerophila abruptaria*, bred by him from a dark wild female crossed with a bred typical male, including a very fine gynandrous example, the left side the ordinary female colour, while the right side had the very dark form of male characters.—Messrs. Harrison and Main, a portion of a brood of *Acidalia versata*, all of which followed the colour and markings of banded parents.—Mr. Gadge, a fine variety of *Abraxas grossulariata*, with mere remnants of the usual black markings, captured on Denmark Hill.—Mr. Goulton, a bred series of *Euchloë cardamines* of unusual size, particularly the males.—Mr. Main, ova of *Pararge egeria* in situ on grass, and living larvæ of *Phorodesma snaragdaria*.—Mr. Coote, (1) living larvæ of *Celastrina argiolus* on ivy berries, from Eastbourne; (2) a photograph of *Oncidium hircina*, from Wiltshire; and a specimen of *Argiades corydon* var. *obsoleta*, from Eastbourne.—Mr. Turner, series of *Parnassius delius* and *Colias palæo* taken in the Engadine in August.—Mr. Sich, (1) *Tineola biselliella*, bred specimens of large size, larvæ fed on red cloth; and (2) *Borkhausenia pseudospretella*, from larvæ found in flax-seed by Mr. W. West.—Dr. Chapman, (1) *Plebius argus* (*ægon*), uniformly dark on the upper side; and (2) larvæ of *Cleogene peletieraria* with imagines from Gavarnie and specimens of *C. niveata* from Corinthia for comparison.—*Hy. J. TURNER, Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—September 23rd, 1907.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. G. H. Kenrick exhibited various Lepidoptera from Wicken Fen, collected by him during a few days' visit. Amongst others were *Erastria argentula*, Hb., which a local man told him was not native to the Fen, but had been introduced there by himself; there were also *Phragmatæcia castaneæ*, Hb., *Meliana flammea*, Curt., *Pyrausta ciliaris*, Hb., &c.—Mr. Hubert Langley showed various Lepidoptera taken by him at Princeethorpe Wood, South Warwickshire, during the second week in July; there was a long series of *Boarmia roboraria*, a species hitherto regarded as very rare in the county, but which was very common on this occasion, when many males came to light between 10.45 and 11.30 p.m. at night; there were also *Aplecta prasina*, F., a very dark specimen; *Habrosyne derasa*, L.; *Euchloris pustulata*, Hufn. (*bajularia*, Schiff.); *Cidaria silacea*, Hb., &c.—Mr. L. Doncaster showed a very interesting bred series of *Abraxas grossulariata*, L., bred and arranged in connection with the Mendelian hypothesis. The experiments had been made with var. *flavafasciata* (*lacticolor*, Raynor). He said that in nature the variety occurs only in the female sex. The results of the experiments, whilst according generally with the required Mendelian proportions, were curiously complicated with the sex question; for although in the second generation = cross \times cross, the proportions were three to one, yet the males were all the dominant, i.e. the type,

and the females half and half; whilst still more curiously, when paired male cross \times pure female var., the results gave half and half each sex, and if reversed and paired male pure var. (obtained during the experiments) \times female cross, the results were all males, type, *i. e.* dominant, and all females, var., *i. e.* recessive.—Mr. G. T. Bethune-Baker showed a series of Turkestan *Arctias*; a large and beautiful series of *Arctia intercalaris*, Er., with light and dark forms; a few *A. erschoffii*, Alph., with var. *issyka*, Std., and a long series of *A. glaphyra*, Er., var. *manni*, Alph.; he pointed out how much some of the *manni* resembled *erschoffii*, and said that he believed they would prove to be forms of one species, and he thought it possible that var. *issyka* would have to be regarded as distinct.—Mr. H. Langley also showed the *Stauropus fagi*, L., from Princeethorpe, referred to at the previous meeting.—COLBRAN J. WAINWRIGHT, Hon. Sec.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—September 17th, 1907.—Mr. C. W. Simmons, of Tufnell Park, and Mr. E. Turner, of Twickenham, were elected to membership.—Mr. S. J. Bell, *Lycana arion* from North Cornwall, in excellent condition, although taken between July 25th and 31st, 1907.—Rev. C. R. N. Burrows, two *Agrotis obscura*, females, taken on September 7th and 14th, 1907, and ova laid by same, twelve specimens having been taken at Mucking during late August and early September, 1907.—Mr. J. A. Clark, dark *Boarmia repandata*, similar to London form, from Pitlochrie.—Dr. G. G. C. Hodgson, *Lycana bellargus*, females, taken in Surrey, Sussex, and Kent between May 26th and July 23rd, 1907; the specimens were unusually blue, which fact Dr. Hodgson suggested had some relation to the inclement season.—Mr. A. W. Mera, *Abraeas ulmata* from Chalfont Road, July 8th, 1907, with black markings almost obsolete.—Mr. C. P. Pickett, *Satyrus tithonus* from Dawlish, August, 1907, including specimens with abnormally large ocelli on forewings and others lacking the usual central white dot in same.—Mr. J. Riches, dark *Cosmotricha potatoria*, from Eastbourne larva.—Mr. P. H. Tautz, *Stauropus fagi*, taken at Chorley Wood about July 15th, 1907.—Mr. J. Riches reported having seen a spent *Smerinthus tiliæ* female at Hornsey on September 14th.—S. BELL, Hon. Sec.

RECENT LITERATURE.

Australian Insects. By WALTER W. FROGGATT, F.L.S., Government Entomologist, New South Wales. Royal 8vo, pp. 500. Frontispiece in colour, 37 black and white plates containing 270 figures, and 180 figures in the text. Sydney: William Brooks & Company, Ltd. 1907.

In this exceedingly well got up and liberally illustrated volume the author furnishes a text-book on the insects of Australia which appeals not only to the nature lover, but also to the entomological student. To the latter it will be most helpful, whilst the former will find much of interest in its pages, and the illustrations, many reproduced from photographs, will show him a number of the various forms of insect-

life occurring in Australia. The sequence of the orders is as follows:—1. Aptera. 2. Orthoptera (7 plates). 3. Neuroptera (2 plates). 4. Hymenoptera (7 plates). 5. Coleoptera (2 plates). 6. Lepidoptera (Rhopalocera, 3 plates; Heterocera, 5 plates). 7. Diptera (4 plates). 8. Hemiptera (2 plates; Homoptera, 4 plates; Anoplecta; and Mallophaga). 9. Thysanoptera (1 plate).

The Termitidae—here included in Orthoptera, and placed immediately after the Blattidae, and before the Embiidæ—are well represented; thirty-five species have been detected, and it is thought probable that others may yet be found in Australia. The reproductions of photographs of the mounds built up by "white ants," on plates iii. and iv., are extremely good; the termitarium of *Eutermes pyriformis* is said to sometimes attain a height of eighteen feet.

Some of the insects belonging to Neuroptera are of curious structure. *Croce attenuata*, for example, has the fore wings like those of a mayfly, but the hind wings are very slender affairs, and greatly exceed the body in length. Among the Odonata, of which family over one hundred species are found in Australia, there is *Petalura gigantea*, measuring from 5 to 6½ in. in expanse. Australia is rich in Hymenoptera, but the Coleoptera are perhaps better known, as our author states that some thousands have been added to Masters' Catalogue, in which 7200 species were enumerated. In Lepidoptera the number of Nymphalidæ has not been indicated, but of Lycaenidæ about 114 species appear to be known, although many are local and rare. Just over thirty species of Pieridæ and about twenty species of Papilionidæ occur in Australia; whilst of Hesperiidæ seventy-nine species have been identified. Moths are well represented in all parts of Australia, and among the Noctuidæ are noted *Leucania unipuncta*, *Heliothis armigera*, and *Prodenia littoralis*, all of which have occasionally been observed in England. In 1864 Schiner estimated the number of described Australian species of Diptera at 1056, and since that date a large number have no doubt been added. In this order, and also in Hemiptera, there seems not to be any complete catalogues of Australian species.

Of course, only some of the species in the families of each order are dealt with, but the selection made appears to be a useful one. Discussing the Sphingidæ, our author, on p. 237, states that "they take their scientific name from the fanciful resemblance of their stiff horny pupæ . . . to the Egyptian Sphinx." We had always supposed that the sphinx-like attitude of the larva when resting suggested the name. Further down on the same page the larva of *Chærocampa celerio* is said to have eye-like spots on the hind segments; in this statement *hind* is probably a misprint for *front*. There are one or two other observations that are new to us, but space does not permit of further reference to them.

Butterflies of Hong Kong and South-east China. By J. C. KERSHAW, F.L.S., &c.

PART VI., completing this work, has recently come to hand. On pp. 121-140 the Hesperiidæ are dealt with. General notes, appendix,

and notes on collecting occupy a further sixteen pages. Various other matters, including a glossary of terms, errata, and index, bring up the number of pages in the volume to 184. There are also eight plates, of which one in colour represents the Hesperid butterflies (plate xiv.). Plates ia-iv a give coloured figures of larvæ and pupæ. Life-history and other details are figured on plates viii and viii a.

The publishers are Kelly and Walsh, Hong Kong, Shanghai, Singapore, and Yokohama; and R. H. Porter, Princes Street, is the London agent.

The following publications have also been received:—

Diptera Danica Genera and Species of Flies hitherto found in Denmark.
By WILLIAM LUNDBECK. Part I. Stratiomyidae, Xylophagidae, Cœnomyiidae, Tabanidae, Leptidae, Acroceridae. Pp. 166. With portrait of R. C. Stæger, and forty-seven figures. Copenhagen: G. E. C. Gad. London: William Wesley & Son. 1907.

The majority of the species discussed in this part occur in Britain. The work is to be completed in about ten parts.

Les Premiers Etats des Lépidoptères Français Rhopalocera (Anciens Diurnes). Par M. C. FRIONNET, Professeur de Sciences Naturelles au Collège de Saint-Dizier, &c. Pp. i-xl, 1-320. Three plain plates. Saint-Dizier. 1906. (May be had of A. Hermann, Rue de la Sorbonne, Paris.)

Précis des Caractères Génériques des Insectes, disposés dans un Ordre Naturel. Par le CITOYEN LATREILLE. A Paris, chez Prévôt Libraire, Quai des Augustins et à Brive, chez F. Bordeaux: Imprimeur Libraire. (1907.) (Sold by A. Hermann as above.)

Pierre-André Latreille à Brive de 1762 à 1798. Par LOUIS DE NUSSAC. Sous-Bibliothécaire au Muséum d'Histoire Naturelle. Pp. 264. Paris: G. Steinheil, Rue Casimir-Delavigne 2. 1907.

Manchester Microscopical Society. Annual Report and Transactions, 1906. Pp. 97. Manchester: The Society. July, 1907. Contains "Notes on Scolytidae or Bark Beetles," by A. T. Gillanders (pp. 69-75).

Report of the Entomological Department of the New Jersey Agricultural College Experimental Station, New Brunswick, N.J. By JOHN B. SMITH, Sc.D. For the year 1906. Pp. i-iv, 517-670.

The under-mentioned are reprints from the 'Proceedings of the U. S. National Museum':—

The Decticinæ (a Group of Orthoptera) of North America. By ANDREW NELSON CAUDELL. (No. 1580, vol. xxxii. pp. 285-410. May 23rd, 1907.)

Revision of the American Moths of the Genus Argyresthia. By AUGUST BUSCK. (No. 1506, vol. xxxii. pp. 5-24, with plates iv.-v. 1907.)

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[No. 585

NEW AMERICAN BEES.—V.

By T. D. A. COCKERELL.

Nomada lippiae sublippiae, var. nov.

♂. Clypeus black; no supraclypeal mark; lateral face-marks narrower above.

Hab. Las Cruces, New Mexico, at flowers of *Solidago*, Sept. 15th, 1895 (Cockerell).

Nomada crucis, Ckll.

This was described from males only. At Cloudercroft, New Mexico, Mr. H. L. Vicreck took a female (June 16th, 1902), to which I can only refer here. It differs from the male in the larger size, black clypeus, and absence of supraclypeal marks. It is easily known from *N. texana* by the coarse punctures of mesothorax; from *modesta* by the absence of yellow spots on metathorax; from *neomexicana* by the yellow tegulae, and two light yellow bands (the second interrupted) on venter of abdomen; from *modesta rivertonensis* by the flagellum red beneath; from *vegana* by the black clypeus and metathorax.

Nomada (Micronomada) garciana, sp. nov. (*snowi*, subsp.?).

♂. Length about 7 mm.; black, with the light markings on head and thorax ivory-colour or yellowish-white, the abdominal bands dull yellow; legs clear red, with spots on middle and hind coxae, small spots at apex of anterior and middle tibiae, large spot at apex of hind tibiae, and hind basitarsi, all white. Face pale practically up to level of antennae, the lateral marks extending beyond, and ending at an angle of 45°; antennae red, a little suffused with dusky above, third joint about or almost twice as long as fourth; mesothorax shining, with strong punctures, quite widely separated in the middle; upper border of prothorax, tubercles, a large transverse patch on pleura, scutellum, and post-scutellum, all pale, the scutellums more strongly yellow; metathorax without yellow or white marks, but its lower half

ferruginous; tegulae yellowish-white; wings long, strongly dusky at tip, b. n. meeting t. m. a little on the outer side, second s. m. nearly as large as third; abdomen strongly punctured, with five entire yellow bands; apical plate very strongly notched; venter with the first two segments largely ferruginous, the third and fourth with broad dull yellow bands. In my table of Rocky Mountain *Nomada* (Bull. 94, Colo. Exp. Sta.) this runs to *N. snowi*, Cresson, to which it appears to be allied. It differs, however, by the ferruginous colour on the metathorax, the absence of black marks on the legs, and the band on first abdominal segment not "deeply indented on each side anteriorly." The scape is obscurely whitish beneath, not with a white spot. It is possible that it represents a southern race or subspecies of *N. snowi*. The spine on anterior coxa is ferruginous, of moderate length.

Hab. Mesilla Park, New Mexico, on the College Farm, May 1st, at flowers of *Melilotus indica*, along with *Halictus bardus*, Cress., *H. mesillensis*, Ckll., *H. pectoraloides*, Ckll. (many), *H. meliloti*, Ckll., *Spinoliella meliloti*, Ckll., *Sphecodes* and *Prosopis*. Named after Professor Fabian Garcia, of the New Mexico Agricultural College.

Epeolus barberiellus, sp. nov.

♀. Length $5\frac{1}{2}$ mm.; black, with the usual pale markings; mandibles and labrum ferruginous; clypeus rugosopunctate; flagellum dull reddish beneath; vertex shining, with strong punctures; mesothorax shining, with strong close punctures; lower part of pleura the same; mesothorax obscurely and suffusedly bilineate, the bands of hair connected with the general hairiness of the anterior lateral margins; scutellum flat, scutellar teeth black and almost obsolete; tegulae clear apricot colour; wings dusky; legs red, the femora reddish-black except at apex; tibiae clouded with dusky; spurs red; first abdominal segment covered with hair except a large discal T; segments 2 to 4 with very broad hair-bands, that on 2 narrowly interrupted; fifth and apex reddish, silvery lunule short; venter rufescent. *E. crucis*, Ckll., occurring in the same district, is easily separated by the longer, red, scutellar teeth, the large distinct spot of hair on anterior part of mesothorax, &c.

Hab. Mesilla Park, New Mexico, April 22nd (C. M. Barber).

Perdita lepidii, sp. nov.

♀. Length just over 5 mm.; head blue-green; front and vertex dull, with a granular surface, cheeks shining; face-marks cream colour, consisting of long-pyriform lateral marks, and a light crescent occupying the upper edge of the clypeus, and sending downwards a large lobe-like projection in the median line; labrum black; mandibles with the basal half yellowish-white, the apical ferruginous; antennae dark, the flagellum dull pale yellow beneath; mesothorax yellow-green, exceedingly shiny, with a strong median groove; scutellum like mesothorax, but post-scutellum and metathorax dull blue-green; pleura blue-green, shining; tubercles cream colour; wings dusky, nervures

and margin of stigma dilute sepia; third discoidal cell very distinct; legs black, with the anterior and middle tibiae in front, anterior tarsi and the knees, light yellow; middle tarsi pale brownish; abdomen black, with bright yellow markings, consisting of a pair of little spots on first segment, and large oblique marks on sides of second, third, and fourth; venter dark. Labial palpi comparatively short, the first joint about as long as the other three together. Runs in table of *Perdita* (Proc. Phila. Acad. 1896) to *P. obscurata*, from which it differs by the brown nervures and markings of thorax.

Hab. Florissant, Colorado, at flowers of *Lepidium jonesii*, Rydberg, July 28th, 1907; two females (S. A. Rohwer). At the same time, place, and flowers, Mr. Rohwer took *Perdita tortifoliae*, Ckll., six females, and *P. florissantella*, Ckll., three females, two males. It has occurred to me that possibly *tortifoliae* may be a mutation of *florissantella*, although the face-marks are radically different, and there is no sign of anything intermediate, unless a single *tortifoliae* with a little short light stripe on the clypeus can be so regarded. In 1906 the very numerous specimens from *Eriogonum umbellatum* were all *florissantella*; but in 1907 (July 21st-23rd) Mr. Rohwer took from this flower eight *florissantella* and one *tortifoliae*.

Dioxys aurifusca (Titus).

Chrysopheon aurifuscus, Titus, Canad. Entom. 1901, p. 256 (Colorado).

After studying one of the types of this very distinct species, I am persuaded that *Chrysopheon* is not more than a subgenus of *Dioxys*. The species has some resemblance to the Algerian *D. rufiventris*, Lep.

Dioxys martii, Ckll.

I have before me two examples taken by Professor C. H. T. Townsend at Las Cruces, New Mexico, May 10th and 11th. These show that the venational character cited in the original description (first r. n. joining first s. m.) is not constant; but the species is easily known from *D. producta* by the rounded, not produced, apex of abdomen.

Nomada subaccepta, sp. nov.

♂. Length a little over 8 mm.; head and thorax black, with quite abundant white hair, which is dense and silky on face; clypeus, lateral marks, labrum, basal half of mandibles and scape in front all pale yellow; labrum hairy, and with a small red tubercle; lateral marks very broad below, but rapidly narrowing to a line which ends at level of antennae; cheeks entirely black; a small red spot above each eye; scape stout, but not swollen; third joint a little over half as long as fourth; flagellum stout but normal (not dentate or conspicuously undulate), red, the basal half black, and the apical more or less dusky, above, though even on the black part there are red sutural

lines; scutellum strongly bilobed, bright red; a little red on postscutellum; mesothorax black or faintly red; tubercles and a patch on pleura beneath them red more or less stained with yellow; tegulae red; wings dark at apex; b. n. going a short distance basad of t. m.; second s. m. at least as broad above as third; legs red, hind femora black except at apex; middle femora with a variable amount of black; hind basitarsus largely black without; abdomen very minutely punctured, rather light red, first segment with the basal half black, and without any yellow; second to fourth with broadly interrupted pale yellow bands, or large lateral spots, those on second when very large notched anteriorly at the sides; fifth and sixth with narrow bands, not or hardly interrupted, that on fifth when well developed notched posteriorly at the sides; apical plate broad and notched; venter red, the first segment with a large bilobed black patch, the others more or less stained with blackish, the third and fourth with slight yellow markings, the apex with a large yellow patch. In my tables of Rocky Mountain *Nomada* runs to *N. vicinalis*, but differs by its smaller size, base of metathorax with distinct though delicate longitudinal ridges, absence of yellow on first abdominal segment, &c. If the male of *N. accepta* had been unknown, I should have been inclined to refer *subaccepta* to that species; but Cresson describes male *accepta*, and it differs by having only the anterior margin of the clypeus light, &c. In many respects it resembles the Canadian *N. armatella*, Ckll., but the form of the apical plate is different, there is no supraclypeal mark, and the flagellum is not entirely red. In Schmiedcknecht's table of European species it runs to twenty-eight, and runs out because of the red scutellum.

Hab. Florissant, Colorado, two males, June 13th and 15th, 1907 (S. A. Rohwer). One was at flowers of *Antennaria microphylla*.

Another male *Nomada*, taken by Mr. Rohwer at Florissant, on June 15th, also runs to *vicinalis* in the Rocky Mountain table; while in Robertson's table (Canad. Entom. 1903, p. 179) it runs to *N. illinoiensis*. It is really very close to *illinoiensis*, but it has the hair of the vertex and thorax above ferruginous, the scutellum with a pair of large red spots, and the bright lemon yellow on the abdomen very well developed. Its length is 8 mm. I do not describe it as new, because I think it is very likely to prove to be the male of *N. cymbalariae*, Ckll., hitherto known from a single female. The sexes in this group are so different that their correct association is a matter of great difficulty.

Melissodes fremontii, sp. nov.

♂. In nearly all respects, including the structure of the antennæ, &c., like *M. confusa*, Cresson, but differing as follows:—Eyes green; face conspicuously broader, eyes more diverging above; antennæ black, but in a strong light most of the flagellar joints show a dark red spot beneath; abdomen narrower and more cylindrical; of the four lateral subapical spines which are so prominent in *M. confusa*, the anterior ones are very small and easily overlooked, yet quite well

formed, while the posterior are reduced to mere dentiform rudiments. The apical portion of the marginal cell is shorter than in *confusa*. The *M. confusa* compared is one of Cresson's types.

Hab. Florissant, Colorado, at flowers of *Geranium fremontii*, July 23rd, 1907 (S. A. Rohwer).

Melissodes mysops, Ckll.

Mr. S. A. Rohwer took one female and fourteen males at flowers of *Carduus aculeescens* at Florissant, July 24th-29th, 1907. The males mostly differ from the type in having the yellow of the clypeus strongly trilobed, and the scutellum is often without black hair; but the species remains quite distinct from *M. cnici*.

University of Colorado, Boulder, Colorado :
October 15th, 1907.

NEW MICROJOPPA FROM TRINIDAD.

By P. CAMERON.

Microjoppa dentipes, sp. nov.

Bright orange yellow, the antennæ, front except laterally, vertex, upper part of occiput narrowly, middle of pronotum, mesonotum, middle of scutellum to the lateral furrows, the third abdominal segment except laterally and the following entirely, black; the black on the apical segments tinged with violaceous. Wings yellowish hyaline to the transverse basal nervure, the following part clear hyaline, the apex from shortly behind the apical abscissa of the radius, the cloud becoming narrowed behind, and a narrower cloud on the apex of the hind wings, fuscous, the stigma and apical nervures black. Legs coloured like the body, the apical half of hind femora, about the basal fourth of hind tibiæ and the four posterior tibiæ, black. Pubescence dense and white. ♂. Length, 14 mm.

Trinidad.

First abdominal segment except narrowly at the base, and the second strongly, acutely longitudinally striated, the basal three-fourths of the third more closely and finely striated. Apex of clypeus with two rows of punctures, the rest of the head smooth. Scutellum sparsely punctured, more closely towards the apex, the sides before the apex irregularly longitudinally striated; the sides stoutly keeled to near the apex, furrowed inside the keel. Basal third of metanotum smooth, the rest closely, distinctly, but not strongly punctured. Areola slightly wider than long, the apex rounded inwardly. Apex of mesopleuræ with a crenulated border. On the inner side of the hind coxæ, near the apex, is a short, stout tooth. Areolet narrowed in front, the nervures almost touching, the recurrent nervure received shortly beyond the middle.

Allied to *M. geniculata*, Cam.

OBSERVATIONS ON THE SPECIES OF THE GENUS
CALLIMENUS, FISCHER DE WALDHEIM (ORTHOPTERA,
 BRADYPORIDÆ).

By A. M. SHUGUROFF (Odessa).

(Concluded from p. 251.)

Returning to a brief revision of the species of the genus *Callimenus*, we are at once struck with the impossibility of determining the greater number of specimens which fall into the hands of entomologists by means of the synoptical tables at present in existence. This is partly explained by the fact that the form of the pronotum varies to a remarkable extent in *Callimenus*, and also the number of keels or ridges on the hinder margin of the abdominal segments. This is most unreliable. It is hard to find two specimens exactly agreeing in colour. The variation, too, in the size of the tubercular ridges on the segments of the abdomen has been sufficiently noticed.

But apart from this individual variability* observed in morphologically equivalent individuals, in *Callimenus*, malformation (*monstrositas*, *Missbildung*) is, evidently, also observed; at least, it is particularly to this kind of variation that I am inclined to attribute such an incident as, for instance, I have observed in a male in my own collection, when the right mesosternal lobe is bifid at the extremity, although in the diagnosis these lobes should be described as "magis acuminati."

The comparison of the same morphological peculiarities in different species of the genus *Callimenus* enables us to draw up the table given on p. 178,† the material for which was afforded by the descriptions of Brunner, the collection of the Oxford Museum,‡ and the personal observations of the author of this article.

In the genus *Callimenus*, erected by the learned Russian, Fischer de Waldheim, in his letter to Serville in 1833, in the Ann.

* In the use of this term I follow the interpretation of Duncker, "Die Methode der Variations-Statistik" ("Arch. f. Entm.-mech. der Organismi," viii. (1899)). Hugo de Fries, for individual variation, employs the term "fluctuation," but Prof. Shimkevich (Hor. St. Pet. N. H. Soc. xxxv. 4, pp. 28-29 (1906)) calls it "flexibility."

† [That is, of course, a reference to the pagination of the 'Revue' in which this article originally appears.—M. B.]

‡ Mr. Burr kindly consented to allow me to publish the synoptical table which was drawn up by him; at the same time he gave me the information about the female of *C. montandoni*, Burr., the description of which had not previously been published. For this friendly assistance I have pleasure in expressing to him my sincere thanks.

[This is a mistake on the part of M. Shuguroff. The material is in my own collection, at present stored in the Hope Museum by the kindness of Professor Poulton. Hence the error.—M. B.]

Soc. Ent. Fr. ii. p. 318, there are included at the present time six species, of which five belong to the European fauna. These five species are the following:—

Callimenus oniscus, Charp. (1839).

C. longicollis, Schulth. (1881) = *pancici*, Brunn.-Watt. (1881).

C. montandoni, Burr. (1898) = *longicollis*, Fieb. non Schulth.

C. dilatatus, Stål (1875) = *inflatus*, Brunn.-Watt. (1882).

C. brauneri, Shug. (1907).

The sixth species, hitherto only known from Persia, is *C. latipes*, Stål.*

The synonymy of the species of *Callimenus* is exceedingly confused.

Thus Lefebvre, in 1831, in Guérin's *Magasin de Zool.* i. No. 5, gave the description of some kind of "Ground Pig"† (*vide* fig. 1 on pl. 5, ♀, *l. c.*) under the name of *Epippiger macrogaster*,‡ in the opinion of Mr. Burr (*in litt.*) entirely distinct from *C. oniscus*, Charp., and approaching the species of the type of *C. montandoni* and *C. brauneri*. In the meantime, every author, from Fischer, of Fribourg,§ to Jacobson,|| regards *C. macrogaster*, Lef., as synonymous with *C. oniscus*, Charp., acknowledging the right of priority to Lefebvre's name.

C. longicollis, Fieb., is queried by Brunner von Wattenwyl¶ as a synonym of *C. pancici*, but, as it seems to me, without sufficient grounds.

Fieber** describes his var. *a* in such a way that his diagnosis may be also referred to *C. pancici*, Br. v. Watt., and especially to *C. montandoni*, Burr, a synonym of which it evidently is.

C. longicollis, Schulthess-Rechberg, was described by that author in 1881 from specimens from Nish, in Servia, in his article, "Eine Excursion nach Serbien."††

Schulthess writes:—"This species is closely allied to *C. oniscus*, Charp., which is common throughout Greece, and is distinguished by the form of the subgenital lamina of the female, the somewhat more obtuse lobes of the metasternum, and through a different arrangement of the folds of the pronotum, which has thus the appearance of a somewhat greater length." In spite of the vagueness of the specific distinctions in the case of Schulthess's species, it is still possible to affirm, with a sufficient

* [A seventh, very distinct, species was brought home by Senor Escalera, also from Persia, and will be described by Bolivar.—M. B.]

† ["Zemliannais Svinka," the popular Russian name for these remarkable insects.—M. B.]

‡ Unfortunately I have had no access to Lefebvre's work.

§ Orth. Eur. 1853, p. 208.

|| Jacobson and Bianki, Priam. i. Lozhn. Ross. Imp. 1905, p. 421.

¶ Prod. Eur. Orth. 1882.

** Syn. Eur. Orth. Lotos. iv. 1853.

†† Mitth. Schweiz. Ent. Ges. vi. 5, 1881, pp. 383-384.

degree of confidence, that he was dealing with that form which was described two years later by Brunner von Wattenwyl under the name of *C. pancici*.

A comparison of the five European species gives us a foundation for the following synoptical table for their determination:—

1. (2) Pronotum (male) strongly inflated posteriorly. Subgenital lamina (male) very convex, with a broad emargination *C. dilatatus*, Stål.
2. (1) Pronotum not inflated.
3. (6) Mesosternal lobes cylindrical.
4. (5) Length of mesosternal lobes equal to their breadth. Subgenital lamina (male) with slight emargination, but with ridges on the sides; female rounded posteriorly apically, with a sharp tooth in the inner margin; pointed apically in female *C. oniscus*, Charp.
5. (4) Mesosternal lobes longer than broad. Subgenital lamina (male) entire, with lateral ridges; in the female broad, emarginate posteriorly and laterally, with teeth at the posterior angles and at the base; cerci (male) conical and pointed with a strong tooth; same in female *C. longicollis*, Schult.
6. (3) Mesosternal lobes obtusely triangular; subgenital lamina (male) entire, with lateral ridges, but rounded in the female with an apical emargination, and cerci (male) cylindrical and rounded, but short in female, conical and pointed.
7. (8) Mesosternal lobes blunt at the apex. Metasternal lobes blunt, rounded apically, slightly longer than broad *C. montandoni*, Burr.
8. (7) Mesosternal lobes pointed apically; metasternal lobes narrow, longer than broad, parallel, pointed at the apex itself *C. brauneri*, Shug.

From this table it is evident that *C. brauneri*, Shug., stands nearest to *C. montandoni*, Burr, and it is possible that both species may turn out to be local races of one form; for the determination of this question, it is necessary to have material from all localities north, north-west, and north-east of the shores of the Black Sea. At the present time, when in the Zoological Museum of the Imperial Academy of Sciences at St. Petersburg there are only sixteen specimens of *Callimenus* of various species, and in the National History Museum of the Chersonese only two,* and

* See my note about this in the Rev. Russe d'Ent. 1906.

in my collection four, of which two are damaged, it is impossible to solve this question.

The species of *Callimenus* (I do not include *C. latipes*, Stål, in this review) are recorded from the following localities in Europe and Asia Minor:—

Callimenus oniscus, Charp.: Transylvania (Hermannopolis, Prof. Fuss.);* Greece (Thessaly, Epirus, the neighbourhood of Athens); Turkey (Macedonia);† Asia Minor;‡ Roumania (according to Fischer, "Valachia, near mts. Kraiova");§ Russia (Government of Cherson);|| Province of Kuban (?);¶ Ekaterinoslav (Veliko-anadol);** Government of Kharkoff (near the town of Kharkoff);†† and of Voronezh).††

C. longicollis, Schult. (non Fieb.!) has been found near Nish, in Servia, §§ and in Turkey.||

C. dilatatus, Stål, has been found at Amasia, and generally in Asia Minor up to Lake Van.

C. montandoni, Burr, was found in Roumania, ¶¶ and in Bessarabia.

C. brauneri, Shug., was found in Northern Ciscaucasia, in the valley of the Manuich,*** near Rostov-on-the-Don.

As regards the record by Jacobson of *C. oniscus*, Charp., from the Crimea, it appears that it arose through a slight misunderstanding. The "Station Sennaja," near which, according to Fischer, Stevens's *Callimenus* was found, is not in the Crimea, but in the Taman Peninsula, on the south-eastern shore of the Tamansky Gulf; so that all records of Fischer Fr., Jacobson, Brunner von Wattenwyl, and Shuguroff, of *Callimenus* from the Crimea, are based upon a simple mistake in geography.†††

From this review of the geographical distribution of the species of *Callimenus*, the following conclusions are evident: of the five European representatives of *Callimenus*, four have a very restricted geographical distribution, and only one (*C. oniscus*, Charp.) inhabits all the northern, western, and eastern shores of the Black Sea and Greece. With regard to the presence of *C. oniscus* within the boundaries of Southern Russia, the records

* Fisch. Fr. Orth. Eur. 1853, p. 203.

† Brunner von Wattenwyl, Prod. Eur. Orth. 1882, p. 252.

‡ Werner, Sitz. k. Ak. Wien., math-nat. Cl., Bd. cx. Abth. i. pp. 285-286.

§ Fisch. Fr. op. cit. p. 203.

|| Shuguroff, Rev. Russe d'Ent. v. 1905, pp. 34-35.

¶ Lindeman, Obsch. Osnov. Entom. p. 206.

** Ibid., p. 206. †† Shuguroff, l. c. p. 35. †† Ibid., p. 35.

§§ Brunner von Wattenwyl, op. cit. p. 253.

¶¶ Schultess, Mitth. Schweiz. Ent. Ges. vi. 5, 1881, p. 384.

¶¶ Burr, Trans. Ent. Soc. Lond. 1898.

*** Shuguroff, Rev. Russe d'Ent. vi. 1906, Nos. 1-2.

††† A. A. Brauner told me that a species of *Callimenus* was found by him near Aleshiekh, but S. A. Mokrzhetzky informed me of the existence of some species of *Callimenus* near the village of Vodianœ in the district of the Dniepr, in the Government of Tabrich.

of many of the older authors are exceedingly doubtful. The discrimination of the species of *Callimenus* by colour and the form of the pronotum is very untrustworthy, and until quite recently it was only to these characters that anyone paid attention when determining specimens of *Callimenus*. These characters have even been admitted for the separation of new species (Fischer de Waldheim).

For this reason a great part of the records of older and even of many modern authors ought to be provisionally referred to other species (e.g. the record of Professor Lindeman). Other data may even refer to some new species, but not in every case to *C. oniscus*, Charp.

With regard to the bionomics of *Callimenus*, they are typical natives of the steppe; Girard* writes that the species of *Callimenus* occurs chiefly in dry regions. A. A. Brauner and I. A. Pachossky found their specimens in meadows lying in valleys and streams, and grown over with spear-grass. In Russia, as I have noted in this connection, the genus is adapted to that belt of the arcto-boreal zone which, in the language of S. Korzhinsky, of the Academy, bears the name of "the typical steppe."

Werner, speaking of *C. dilatatus*, Stål, remarks:—"This species appears to be widely distributed in the steppes of Asia Minor. . . . The railway men know them well as the 'railway beetle,' as it often stops on the railway banks, just like *Testudo ibera*."

Finally, Professor Lindeman saw *Callimenus* on the mud volcanoes of Taman.

All these data, it seems to me, support my view which I expressed before, that *Callimenus* is one of the typical inhabitants of the steppe.

THE DRAGONFLIES OF EPPING FOREST IN 1907.

By F. W. & H. CAMPION.

THE prevalence of inclement weather during the summer months occasioned a scarcity of dragonflies in our district, but the warm and sunny days which came towards the end of the season delayed the disappearance of certain species beyond the usual period. No dragonflies were taken after September 22nd.

The thirteen species enumerated below were collected during the year:—

(1) *Pyrrhosoma nymphula* was met with in small numbers

* *Traité Elém. d'Entom.* ii. 1879, p. 166.

from May 11th, when it was in a very immature state, until July 21st.

(2) *Agrion puella* was on the wing longer than in previous years. Specimens began to be taken on June 9th, and an old worn female, with about half of the abdomen thinly coated with dry mud, was obtained as late as August 25th. On July 7th a male was taken while preying upon a small dipteron; a wing recovered from the dragonfly's jaws was examined by Mr. E. E. Austen, who identified it as belonging to one of the Limnobiidæ, *Erioptera flavescens*.

(3) *Ischnura elegans*.—This was probably the commonest Agrionid, and its season was observed to extend from June 9th



SYMPETRUM SANGUINEUM, ab.

to September 17th. Var. *infuscans* was obtained on June 16th and July 14th—three specimens in all.

(4) *Enallagma cyathigerum*.—The distribution of this species was more widely extended than is usually the case. The first capture was made on June 9th, and the last on September 1st. Blue females were taken singly on July 7th and August 24th and 25th.

(5) *Cordulia ænea*.—A few specimens, including a female, were taken on June 9th and 16th. The males were somewhat smaller than those taken in 1906, although they were still of exceptional size. The largest measured 50.5 mm. in length and 70.5 mm. across the hind wings, and the smallest 48.5 mm. by 68 mm. The length of the female was 51 mm., and the expanse 72 mm.

(6) *Brachytron pratense*.—A fine male was secured on June 16th, some miles away from the locality where the female was taken in 1906. No other specimens were seen.

(7) *Libellula depressa* was met with on one date only (June 16th), when a male was taken without a trace of blue powder on the abdomen.

(8) *Æschna grandis*.—If an empty nymph-case referable to this species found on July 14th may be regarded as belonging to the present season, *Æ. grandis* was then on the wing. The first imago was seen on August 4th, and several matured specimens were taken on the 11th, when the females were ovipositing. On August 6th a female nymph was found clinging to the stem of a plant; it was dead but still fresh, having probably left the water during the preceding night or in the early morning, and perished of the cold then prevailing. It had partly disclosed the imago, and the anterior pair of bright yellow thoracic stripes were very conspicuous. The species remained on the wing longer than usual, specimens being taken at as late a date as September 17th.

(9) *Sympetrum striolatum*.—On July 20th we put up a soft-bodied, freshly emerged imago, doubtless of this species, which flew away across a pond. It was immediately seen and eagerly pursued by a sparrow, and a second sparrow quickly joined in the chase. As far as could be seen, the dragonfly fell a victim to the birds, but in any case the pursuit was very keen. Another specimen was taken on the same date, and thereafter immature individuals occurred sparingly until September 17th. On the 8th of that month the earliest matured examples were met with, including some brilliantly coloured males. The latest capture was made on September 22nd.

(10) *Æschna cyanea*.—The first imago taken was a very immature male, which was resting on rushes bordering a pond, and had probably emerged from the water that day (July 21st). Close by was found a nymph-skin which evidently belonged to the imago previously obtained, for both had the extremity of the abdomen twisted to the right. The species never became common, and the last specimen was taken on September 22nd.

(11) *Anax imperator*.—Two rather worn males, the only specimens noticed during the year, were taken on August 11th, the latest date for the species of which any record is before us.

(12) *Lestes sponsa* was found to be very abundant near Epping on August 15th, when a female was taken measuring only 32 mm. in length and 41.5 mm. in expanse. In other parts of the Forest district specimens occurred singly on August 25th and September 17th and 22nd.

(13) *Sympetrum sanguineum*.—Two males were taken on September 15th; in one of them the wings were much frayed, and the other is the subject of the accompanying figure. As will be seen, the margin of the left hind wing comprises two distinct curves of unequal length and convexity, meeting in a strongly marked notch at the end of the median sector. A slight notch is normally present in the wings of large dragonflies and in those of some other Neuroptera, but the example before us recalls in a striking manner the notch, at the corresponding nervure,

in the wings of certain Orthoptera, where the folding under of the wings takes place.

Sympetrum flaveolum was looked for at the proper period at both localities where it occurred in 1906, but nothing of it was seen. A like negative result attended a search for *S. vulgatum*, notwithstanding that a large number of *S. striolatum* were taken and examined for the characters of the rare species.

33, Maude Terrace, Walthamstow :
October 24th, 1907.

DESCRIPTION OF A NEW SPECIES OF ICHNEUMON
FROM VANCOUVER ISLAND.

By P. CAMERON.

Ichneumon mathewi, sp. nov.

Black; the anterior tibiae white in front, joints 11-23 of flagellum of antennae cream-coloured, wings light fuscous-violaceous, the stigma and nervures black, the disco-cubital nervure with a long stump; areolet 5-angled, hardly half the length in front it is behind; the transverse median nervure received shortly beyond the basal. Palpi black. Head and thorax closely punctured; the apical half of clypeus depressed, the sides and apex with scattered punctures. Scutellum roundly convex, the apical slope straight, oblique, less strongly punctured than the rest. Areola large, slightly wider than long, the base not quite transverse, with the sides rounded, the apex transverse; it is stoutly, closely, longitudinally striated throughout; the striae twisted; the top of the posterior median area is irregularly longitudinally striated, the rest more closely transversely striated; the lateral areas more stoutly obliquely striated. Post-petiole coarsely aciculated, finely, irregularly, aciculated, striated; the apex in the middle raised, smooth. Gastraceli deep, striated. The ventral fold is distinct on the fourth segment. Antennae short, stout, tapering and serrate towards the apex. Length, 17 mm. ♂.

Vancouver Island (G. F. Mathew, R.N.).

In the table of the males given by Mr. Cresson (Trans. Am. Ent. Soc. vi. p. 136) this species comes into section i., close to *galenus*. That species (only the male is known) is "long, slender"; its antennae is also "long, slender," not short and thick, as in the present species, which can hardly be called "slender"; *galenus* has the punctures on mesonotum "indistinct"; in the present species they are clearly defined and distinct. Mr. Cresson's species has the metanotum "densely punctured," while in my species it is stoutly striated. *I. mathewi* is an *Ichneumon* as defined in Dr. Ashmead's table (Bull. U.S. Nat. Mus. xxiii. 17), except that the areola is transverse at the apex. The basal slope of metanotum is deep, steep.

PHALÆNA (BOMBYX) LUBRICIPEDA, LINN.

BY T. H. BRIGGS, M.A., F.E.S.

MR. KIRBY, in his 'Catalogue Lep. Het.' i. p. 227, published in 1892, and in his 'Handbook to the Order Lepidoptera,' published in 1897, gives, in my opinion, conclusive proofs that Linnæus, when he described *Phalæna lubricipeda*, meant our white ermine, commonly known as *Spilosoma menthastræ*, and not the buff one. Yet all entomological magazines, periodicals, and their contributors from those dates seem entirely to have ignored these publications of Mr. Kirby's.*

I have not seen the first-mentioned book, but in his 'Handbook,' vol. iii. p. 130, he refers to—

- (i) *Bombyx lubricipeda* (Linn.), *Syst. Nat.* (ed. x.), i. pp. 505-6, No. 47 (1758).
- (ii) Linn., *Faun. Suec.* ii. p. 303 (1761).
- (iii) *Phalæna lubricipeda* (Scopoli), *Ent. Carn.* p. 208, No. 513 (1763).
- (iv) *Bombyx lubricipeda alba* (Hufnagel), *Berlin Mag.* ii. p. 412, No. 25 (1766).
- (v) *Bombyx menthastræ*, Esper, *Schmett.* ii. p. 334, taf. 66, figs. 6-10 (1786); Hüb. *Eur. Schmett.* iii. figs. 152, 153 (1804?).
- (vi) *Phalæna erminea*, Marsham, *Trans. Linn. Soc.* i. p. 70, pl. 1, fig. 1 (1791). †
- (i) Linn. *Syst. Nat.* (ed. x.), i. pp. 505-6, No. 47 (1758).

lubricipeda. — *P. Bombyx spirilinguis*, alis deflexis *albidis*, punctis nigris, abdomineque quinque fariam nigro punctato.

Larva pilosa, fusca punctis cæruleis, linea dorsali pallida.

Varietatem β non distinctam esse speciem docuit D. De Geer. Linnæus refers to—

- (i) 'Fauna Suecica,' p. 254, No. 823 (1746).
- (ii) Goedart, 'Metamorphosis et Historia Naturalis Insectorum,' tt. 23, 38 (1662-1669).
- (iii) 'List Goedart,' f. 93 (1682).
- (iv) 'Raui Historia Insectorum,' p. 196, No. 155 (1710).
- (v) 'Merian Maria Sybilla, De Europische Insecten,' i. t. 46, f. 65 (1730).

* In this paper I have given *verbatim* those of the references to which Mr. Kirby refers, as far as I have been able to have had access to the authors he quotes, and also to other works of Linnæus and other authors on the same subject not mentioned by Mr. Kirby. It must be remembered that our nomenclature dates from the tenth edition of Linnæus's *Syst. Nat.* (1758), and also that many of the older authors' descriptions are only useful for the purposes of identification, as most of them are descriptions of insects to which no name was applied by them.

† This paper was read at a meeting of the Linnean Society on August 5th, 1788, but, according to Dr. Staudinger, was not published by that Society until 1791, and three other references not material to this paper.

(vi) Albin, 'Natural History of English Insects,' t. 24, f. 36 (1720).
 (vii) Frisch. Ins. 3, t. 8 (1721).
 (viii) Réaumur, De Ins. 2, t. 1, ff. 7-9 (1736).
 (ix) De Geer, Ins. 1, t. 11, ff. 7-8 (1752).
 (x) Roesel, Ins. 1, Phal. 2, t. 46 (1746-1761).
 (xi) Wilkes, one hundred and twenty copper-plates of 'British Butterflies and Moths,' pl. 20, t. 3, a-5 (1740-1761).

Var. β .

Goedart, Ins. t. 38; Roesel, Ins. 1, Phal. 2, t. 47; Wilkes, pap. 20, t. 3, a-b.

This variety β is the source of all the confusion of names, and was evidently the male of the buff ermine; but Linnæus in all his works only considered it as a sexual difference, and at last treated it only as a variety, and never gave a separate name to it.

(i) Linn. 'Fauna Suecica,' p. 254, No. 823 (1746).

Phalæna pectinicornis elinguis; alis deflexis albidis; punctis nigris, abdomine ordinibus quinque punctorum. Mas flavis ordine transverso punctorum nigrorum obliquorum.

(ii) Goedart, tt. 23, 38 (1662-1639); t. 23, a male var. β (the buff ermine) and larva; t. 38, a female white ermine and larva.

(iii) Lister Goedart (1682); f. 93, the var. β , male; f. 96, type, the white ermine female. This author does not name his insects.

(iv) 'Raii Historia Insectorum' (1710). No. 155, p. 197, *Phalæna media ex albido sublutea, alis exterioribus punctis paucis nigris; σικτοις.* This seems to be the var. β ; a male.

No. 40, p. 195, *Phalæna punctata.* This last reference is only named by Linnæus in Syst. Nat. xii., and seems to be a female white ermine. I do not understand the Greek word at the end of each of these diagnoses.

(v) 'Merian Maria Sybilla, De Europische Insecten,' i. t. 46, fig. 65. "Un Papillon *Nocturne*, blanc, raié et tacheté de Noir." (French edition, 1730.) White ermine figured.

(vi) Albin's 'Natural History of English Insects,' t. 24, f. 36 (1720). A figure of the white ermine and its larva; referred to by Linnæus in his Syst. Nat. x. and xii., and in his 'Fauna Suecica,' ii. (1761). Albin states this is Goedart's No. 96.

(vii) Frisch. Ins. 3, tab. 8. *Lubricipeda* female figured; no name given.

(viii) Réaumur, De Ins. 2, p. 61, ff. 7-9 (1736). Mr. Marsham states that he is clearly convinced that it is the *mendica* of Linnæus which is here described, and he states that Réaumur describes the male "as of the colour of a rat," and alludes to the semitransparency of the wings of the female. P. 61, ii.

pl. 1, figs. 4, 7, 9 represent the white ermine, 5 and 6, *mendica*; Réaumur *first* describes the former both sexes, and *then* says he has also obtained from identical larvæ those other forms, figs. 5 and 6.

(ix) De Geer, 1, pp. 183-4, ff. 7, 8 (1752-1778). Knows both species in each sex, but confuses them as one species. He figures (pl. xi. fig. 7) a female *lubricipedata*, and (fig. 8) a male *menthastri*.

(x) Roesel (1746-1761); Theil I. Phal. 2, t. 46 (1753); t. 47 (1758). Two insects are represented on this plate. Tab. 46: The white ermine, larvæ, cocoon, pupa, and imagines; one with wings closed, the other with wings open; both females. Tab. 47: The buff ermine, larvæ, cocoon, pupa, and imagines; one with wings closed, the other with wings open; both males.

(xi) Wilkes, one hundred and twenty copper-plates of 'British Butterflies and Moths'; t. a-6, the white ermine and its larva; t. a-5, the buff ermine and its larva.

Linnæus, Syst. Nat. xii. p. 829, No. 69 (1766).

lubricipedata.—Identical description and references to those of the Syst. Nat. x., except added to the description are the words, "mas alis flavescentibus"; and to the references.

(i) Geoffrey, Paris Hist. Ins. p. 118, No. 21. Describes *menthastri*, but confuses *mendica* with it as a variety, following the lead of Réaumur. This Geoffrey was Etienne Louis, who published 'Histoire Abrégée des Insectes qui se trouvent aux Environs de Paris' (1762).

(ii) Fourcroy, 'Entomologia Parisiensis.' In this work of Geoffrey, edited or published by Fourcroy after his death, ii. p. 263, No. 21 (1785), there is a moth described, *P. lubricipedata*.

P. pectinicornis elinguis, alis deflexis *albidis*, punctis *nigris*, abdomine ordinibus quinque punctorum.

(ii) Scopoli, 'Entomologia Carniolica' (1763).

(iii) Gron. 'Isophylacium Gronovianum' (1763). A work I do not know.

Scopoli, 'Entomologia Carniolica,' p. 208, No. 513 (1763).

Phalæna lubricipedata, Linn. Syst. Nat. p. 505-6 (reference to ed. x.); Linn. 'Fauna Suecica,' ii. No. 1138 (1761).

Diagn. *Alba oculis antennisque nigris*; alis deflexis; anticeis nigro punctatis; abdomine supra paleaceo; punctorum nigrorum ordinibus quinis; antennæ subtus dentatae, basi superne albæ, lingua substraminea, alæ antice punctis nigris (7, 10) tibiæ nigræ.

Linn. 'Fauna Suecica,' ii. p. 303, No. 1138 (1761).

Phalæna (Bombyx) lubricipedata.

lubricipedata.—Spirilinguis, alis deflexis *albidis* punctis *nigris*, abdomine quinque faciam nigro-punctato. *Phalena pectinicornis*

elinguis, alis deflexis *albidis*; punctis nigris, abdomine ordinibus quinque punctorum.

With a reference to Albin's figure, t. 24, f. 36 (the white ermine), and other references not material to this paper, and a further description I have mentioned later when referring to Mr. Marsham's paper.

Fabricius, 'Systema Entomologiae,' p. 576, No. 68 (1775).

lubricipeda.—B. alis deflexis *albidis*, punctis nigris, abdomine quinque faciam nigro-punctato variat alarum colore et punctorum numero supra, folliculum cœrulescens, stigmatibus rubris. And a description of the larva identical with that of Linnæus in his Syst. Nat., which is not that of the buff ermine, nor is the pupa of that species *cœrulescens*, but both are brown.

In both the tenth and twelfth editions of Linnæus's Syst. Nat. he has a var. β , with several references which seem to apply to the male buff ermine, but in both the author states, "Var. β non distinctam esse speciem docuit D. De Geer"; and during the whole of his life Linnæus failed to see that there was any other species included under the name *lubricipeda* than the white-winged one, the only one of which he described the larva; nor did Fabricius separate them. Linnæus seems to have had some doubt about his var. β , as in his twelfth edition he adds the words, "mas alis flavescentibus"; and Fabricius also, when he states "variat alarum colore et punctorum numero," might have had an idea of a second species. Hufnagel, according to Mr. Kirby, described *lubricipeda* and its var. β as *Bombyx lubricipeda alba* and *Bombyx lubricipeda lutea*, but it was, so far as I know, reserved for Esper in 1786 to abandon Linnæus's name of *lubricipeda* for that of *menthastrum*, giving the first name to that variety β of Linnæus which he himself in his lifetime had not recognized or described as a species.

Dr. Staudinger, in his Catalogue of 1871, as regards the white ermine, has No. 781, *menthastrum* (Esper) = *lubricipeda*, L. S. N. x. 505 exc. var. β , Sc. Ent. Carn. 208 (nom. restituend. ?); and yet, in his Catalogue of 1901, he creates this unnamed variety (which he had expressly separated in his Catalogue of 1871) into *lubricipeda*, Linn., Syst. Nat. x. 505-6, although all the descriptions of *lubricipeda* by Linnæus himself were of a moth with white wings. I do not see how it is possible, by any process of reasoning, to take a name an author has given to a species from it, and give it to an insect that author named only as a variety in all his works.

Other authors have tried for some reason to find a new name for our white ermine instead of the var. β of Linnæus. Mr. Marsham, in a paper read at a meeting of the Linnean Society on August 5th, 1788, which paper, according to Dr. Staudinger, was not published until 1791 (Trans. Linn. Soc. vol. i. p. 70),

gives this insect the name of *erminea*, and states:—"Fig. 1, to which I have given the name of *erminea*, appears to be the moth which Linnæus described, in his *Syst. Nat.*, as *lubricipeda*, and to that moth the name is affixed in his cabinet." And his reason for changing the name seems to be that in the description of *lubricipeda* in the *Faun. Suec.*, second edition, are the words, "mas alis flavescentibus ordine oblique transverso punctorum nigrorum," which is a description of the male of our buff ermine, a moth unnamed by Linnæus.

Mr. Leech, in a paper read before the Entomological Society of London, December, 1898, and published in their volume of 'Transactions' for the year 1899, p. 150, names our white ermine *punctaria*, with references to Mr. Kirby, *Cat. Lep. Het.* i. p. 227 (1892), and to Cramer, *Pap. Exot.* iv. p. 283, pl. cccxcviii. fig. 9 (1782), which name (Ray had named it *punctata* in 1710, see *ante*) would have priority over Esper's name of *menthastris* given in 1786.

I think that the whole of these descriptions clearly show that Mr. Kirby was quite correct in stating that the *Phalæna (Bombyx) lubricipeda* of Linnæus is the white species now generally but erroneously known as *Spilosoma menthastris* (Esper).

For the references to Madame Merian, Fisch, Réaumur, De Geer, and Geoffrey I am indebted to the kindness of Mr. Louis B. Prout, who has consulted these authors, and has given me the results of his investigations.

A BIBLIOGRAPHICAL NOTE ON THE FOOD-PLANTS OF ORIENTAL HEMIPTERA.

By G. W. KIRKALDY.

IN the Hemiptera of the 'Fauna of British India' (vols. i.-iii.), Mr. Distant has overlooked some records of food-plants made years ago by himself!

(1) Proc. E. S. London, 1879, p. 1 (with Moore):—

Halyo (!) *dentata*, *Palomena viridissima*, *Piezoderus rubrofasciatus*, *Agonoscelis nubila*, *Lygaeus militaris*,* *Graptostethus servus*.—All on Cucumerineæ.

Coptosoma cribaria on *Lablab vulgaris*.

Bagrada picta, *Pachymerus sordidus*.—Both on *Sinapis dichotoma*.

The names are as given by Distant and Moore.

(2) Proc. E. S. London, 1878, p. lvii:—

Erthesina fullo is eaten by the Nagas.

* Also destructive to *Zea mäis*.—G. W. K.

The following seem also to have been omitted by Mr. Distant, and there are many more records since the publication of his first volume:—

Aspongopus janus on *Cucurbita* and *Cucumeris*.

Canthecona cognata preys on a croton-ravaging caterpillar.

Brachyplatys silphoides is said by Westermann (1821, Mag. Ent. iv. 411–27) to be very injurious to *Oryza sativa* in India, but I have no access to the work. It is translated in Rev. Ent. i. 111–1833.

Myodocha acutus (= *Leptocoris*, Dist.). This is a notorious rice pest; also found on "rubber." It is preyed on by *Cicindela sexpunctata*.

Leptocoris augur (= *Serinetha*, Dist.). Supposed to be mimicked by the lepidopteron *Phauda flammans* (cf. Rothney, 1894, Proc. E. S. London, p. xv.). It occurs on *Gossypium herbaceum* and *Schleichera trijunga*.

Antilocatus coquebertii preys on *Dysdercus cingulatus* (Kirkaldy, 1900, Entom. xxxiii. 295).

Fontejanus wasmanni is termitophilus. (Breddin, 1903, Soc. Ent. xviii. 75.)

Zamila aberrans is destructive to *Saccharum officinarum*. It has been partly confused by Distant with *Dictyophora pallida*.

Peregrinus maidis (= *Pundaluoya simplicia* and *Liburnia psylloides*, Dist.) is destructive to *Zea mäis*.

DESCRIPTION OF A NEW SPECIES OF CRABRONIDÆ FROM BORNEO.

BY P. CAMERON.

Dasyproctus spilaspis, sp. nov.

Black; the mandibles, except at the base, brownish red; a conical spot, wider than long, the narrowed end on the inner side, on either side of the pronotum; the scutellar keels, a broad band on the base of the hind tibiæ, the anterior tarsi entirely, the basal two joints and the base of the third of the middle and the basal joint of the hinder, except narrowly at the apex, whitish yellow. The sides of the head, cheeks and face and clypeus densely covered with silvery pubescence. Eyes very large, coarsely faceted, touching the antennæ below, the front with a distinct furrow. Ocelli in a triangle, the hinder separated from each other by a slightly less distance than they are from the eyes. Metanotum with a broad furrow extending from the base to the apex. Abdominal petiole slender, nodose at apex, longer than the thorax and as long as the rest of the abdomen.

The eyes reach to the base of the mandibles. On the outer lower edge of the cheeks is a stout, longer than wide, rounded at the apex, tooth. Apex of tarsi thickened. Appendicular cellule large, clearly

defined; the apical abscissa of the radius has only a slight slope. There is a short broad deep furrow on the base of mesonotum in the centre. ♀. Length 5 mm.

Kuching, September (Mr. John Hewitt).

DESCRIPTION OF A NEW PLUME-MOTH FROM
CEYLON.

By T. BAINBRIGGE FLETCHER, R.N., F.E.S.

Alucita melanopoda, sp. nov.

Male, 28 mm. Head, antennæ, palpi, thorax, and abdomen pure glistening white. First and second pairs of legs white above, with a few dark scales below on tibia and first joint of tarsus; posterior legs very long, pure white, tips of spurs black, third and fourth joints of tarsi terminating in a large fan-like tuft of black scales, fifth tarsal joint clothed in black scales. Fore wings cleft from one-quarter; segments linear; pure glistening white, sprinkled with very minute black scales; small clusters of black scales, forming dots, on costa at one-third, one-half, and three-quarters, and on second segment a little beyond middle and at three-quarters. Cilia white, with very pale fuscous patches below first segment before middle, at three-quarters, and irregularly between this latter and apex; also on inner margin at one-third, one-half, and three-quarters. Hind wings cleft firstly from about one-sixth, secondly from near base; segments linear; pure glistening white; a patch of faint fuscous on costa of first segment at three-quarters, and also on inner margin of second segment at three-quarters and at one-half; on second segment a moderate patch of black scales at one-half, and small black dots at three-quarters and at apex.

Hab. Ceylon: Madulsima, November, 1906 (W. Vaughan); Kandy, May, 1907; Haragam, June, 1907 (E. E. Green). Assam: Khasi Hills (coll. Meyrick).

H.M.S. 'Sealark,' Ceylon: October 18th, 1907.

THREE NEW BEES FROM THE ORIENTAL
ZOOLOGICAL REGION.

By P. CAMERON.

Nomia nursei, sp. nov.

Black; the scape yellow, the flagellum brownish beneath; the legs bright yellow; the coxae, trochanters and base of the femora, black; the face and clypeus covered with pale golden pubescence; the apices of the basal five segments of the abdomen banded with depressed

grey pubescence ; the hinder femora broadly rounded above, transverse below and with a sharp oblique tooth near the base of the apical third ; the hinder tibiæ become gradually dilated from the base to the apex. ♂. Length, 8 mm.

Deesa (Col. C. G. Nurse).

Scape bright yellow, marked above with black towards the apex ; the flagellum fulvous, lined with black above. The face, clypeus and lower part of the front densely covered with pale golden pubescence, which hides the sculpture ; the front is closely, almost rugosely, punctured and covered with dark fulvous pubescence above ; the vertex is more strongly, but not so closely or regularly, punctured ; there is a smooth space on the outer side of the hinder ocelli. Mandibles black, shining, more or less piceous-red below and at the apex. The base of the mesonotum, its apex, the post-scutellum, and the pleuræ are densely covered with pale fulvous pubescence. The mesonotum and scutellum are closely, strongly, and uniformly punctured. The area on the median segment is closely obliquely striated on the sides ; the centre is more irregularly and more widely striated ; the middle pair of striae are widely separated ; the rest of the segment is closely and rather strongly punctured laterally ; the centre is irregularly rugose, and is hollowed in the middle ; it has a vertical slope. The basal four joints of the front tarsi are fringed with long clear white hair, the hair becoming gradually shorter ; the black on the base of the femora is more extended above ; the tooth on the hinder femora is oblique ; the hinder tibiæ are slightly dilated at the base before the middle ; the apical projection is large, and becomes gradually narrowed towards the apex, which is bluntly rounded. Wings hyaline, the apex slightly smoky ; the stigma and costa are dark testaceous ; the nervures paler in tint. Tegulæ dirty yellowish-testaceous, black on the inner side. Abdomen black, with distinct bands of depressed greyish pubescence on the apices of the basal five segments ; the basal three segments are strongly and closely punctured ; the apical are closely and rather finely rugosely punctured ; the sixth segment has the apical half covered with longish pale fulvous pubescence ; the last is thickly covered with long pale golden hair. The basal segment is roundly incised in the middle ; the last is densely covered with longish pale fulvous hair.

Comes near to *N. fervida*, Sm., but may be known from it by the different shape of the hinder legs. In *fervida*, for instance, the hinder tibiæ are broadly dilated in the middle behind, and end in a long sharp point ; the base of the femora below is turned upwards, in the present species downwards, there being a gradually rounded curve from the base to the tooth.

Colletes nursei, sp. nov.

Black ; the head and thorax thickly covered with white hair ; the abdominal segments broadly banded with white pubescence on their apices ; the apices of the femora, the tibiæ, and the tarsi dark ferruginous, and covered with pale fulvous hair ; the wings hyaline, with

a faint fulvous tinge; the stigma and nervures dark rufous. ♀. Length, 14-15 mm.

Ferozepore (Col. C. G. Nurse).

Clypeus shining, almost bare, distinctly irregularly punctured; the punctures on the lower side more elongate and larger than on the upper; in the middle, commencing near the top, is a wide, shallow, irregular, longitudinal furrow; the apex projects, and is depressed above the projecting part. The labrum is large and projecting; there is a wide and deep furrow on either side; and in the centre, on the apical two-thirds, is a deep furrow with oblique sides, which make the furrow much wider on the top. Apex of mandibles piceous. The vertex is closely, uniformly punctured; the front is much more strongly punctured, but not quite so closely; its upper half is deeply furrowed. Thorax entirely and thickly covered with white hair; the mesonotum is shining and is rather strongly, but not very closely, punctured. The basal areae of the median segment bear stout longitudinal keels; its apex is bounded by a stout keel, so that there is formed a row of squarish areae; the apex of the segment has a vertical slope. The hair on the legs is long and glistening; that on the outer side is brighter and more silvery in tint than on the inner side. The amount of red on the legs probably varies, and is almost hid by the black hair. Abdomen black; the apices of the segments obscure piceous, and thickly covered with a broad band of white pubescence; the base of the basal segment is broadly covered with white pubescence; the last segment is thickly covered above with long black, stiff pubescence; the basal segments are narrowly banded with white pubescence.

Megachile confluenta, sp. nov.

Black; the hair on the head, thorax, and legs white, tinged with grey; the ventral scape bright red; that on the under side of the tarsi of a paler red; wings hyaline, tinged with violaceous, especially towards the apex; the nervures black. Mandibles with a broad, shallow, rounded, curved incision beyond the middle, without distinct teeth; the apex bluntly rounded. ♀. Length, 8-9 mm.

Luirdu, Sarawak, Borneo; June.

Clypeus closely, somewhat strongly punctured throughout; the apex transverse, except at the outer edges, which are roundly curved. Face more closely and much less strongly punctured, except on a small semicircular space on the centre of the apex; the sides of the clypeus with dense long white pubescence, the centre much less thickly haired. The puncturation is close, distinct, less strong on the metanotum than elsewhere. Back of abdomen finely, closely, less strongly punctured than the thorax. The hinder ocelli are separated from each other by about the same distance as they are from the eyes.

Characteristic of this species are the mandibles, which become gradually narrowed to a bluntly rounded point without teeth, not broad and oblique there as in, e. g. *M. alticola* and *M. mæra*.

A BIBLIOGRAPHICAL NOTE ON THE FOOD OF
MIRIDÆ (HEMIPTERA).

By G. W. KIRKALDY.

IN the 'Entomologists' Monthly Magazine' for May, 1903,* Dr. Reuter summarizes the literature on predaceous Miridæ, showing clearly, what was indeed well known to hemipterists previously, that the Miridæ are by no means exclusively phytophagous.

The following references, some overlooked by Dr. Reuter, others of later date than his communication, may be useful:—

1. CAUDELL, 1901, Proc. E. S. Washington, iv. 485. *Plagio-gnathus obscurus* biting human being.
2. KERSHAW, 1905, Trans. E. S. London, 7. Capsid (?) sucking lepidopterous pupa.
3. MERRIFIELD, 1907, Proc. E. S. London (for 1906), p. xc. *Heterotoma merioptera* destroying eggs of *Papilio*.
4. NOWICKI, 1871, Verh. zool. bot. Ges. Wien, xxi. Beih. 52. *Miris dolabratus* said to attack the dipteron *Chlorops tæniopa*.
5. VERHOEFF, 1891, Ent. Nachr. xvii. 26. *Deræocoris ruber* (*Capsus capillaris*) preying on Aphidæ.

ON THE BORNEAN TIPHIIDÆ, INCLUDING A NEW
GENUS.

By P. CAMERON.

CYANOTIPHIA, gen. nov.

♀. Middle tibiæ with two spurs. Marginal cell half closed at apex. First transverse cubitus entirely absent; transverse median nervure interstitial; transverse median in hind wings angled and broken in the middle. Tegulae large, about half the length of the pro- and mesonotum. Base and apex of thorax transverse; the top of metanotum keeled at apex, and bearing longitudinal keels. Base of first abdominal segment transverse, strongly keeled above; the second segment with a crenulated furrow at the base. Hind tibiæ stoutly serrate; claws bifid unequally; hind femora dilated roundly below at the apex. Base of second abdominal segment largely produced below the apex of first. Mandibles edentate, large, furrowed in the middle. Body for the greater part blue.

May be known from the described Old World genera, *e.g.* *Tiphia*, by the middle tibiæ having two spurs, by the abnormally large tegulae, by the almost closed radial cellule in female, and

* 'The Food of Capsids,' pp. 121-3.

by the broad keeled base of abdomen. Its nearest ally appears to be the American *Paratiphia*, which may be known from it by the radial cellule in the female being entirely open at apex, by the first transverse cubital nervure being only obliterated below, by the broad temples, and by the bidentate mandibles. The blue coloration of *Cyanotiphia* is peculiar, and has not been recorded before with the Tiphids.

Cyanotiphia ruficauda, sp. nov.

Black, tinged with blue; the basal five abdominal segments blue, the apical red; legs black, densely covered with long white hair, the four anterior calcaria white, the posterior fulvous, the hind tibiæ with six stout spines, which become gradually longer and thinner, the apical being considerably longer and thinner than the others. In the centre of metanotum are two straight keels, which converge slightly towards the apex, between them is a more irregular one which does not reach to the apex; on either side are two slightly curved keels, united at the base, the inner of which does not quite reach to the apex; the space between these keels is irregularly transversely striated. Metapleuræ smooth at the base, the rest somewhat strongly, closely, obliquely striated, the two parts being separated by a furrow. Head, pro- and mesonotum strongly punctured, the punctures clearly separated, the propleuræ strongly, closely, irregularly striated, the mesopleuræ closely rugosely reticulated. Basal slope and a narrow band on the apex of first abdominal segment smooth, the rest closely distinctly punctured. ♀.

The body is much less densely pilose than in *Paratiphia*; the abdominal segments, too, not being fringed with hair. Length, 8 mm.

Quop, Sarawak; October (John Hewitt, of the Sarawak Museum).

Tiphia borneana, sp. nov.

Black, shining, sparsely covered with whitish pubescence; the four anterior tibiæ and tarsi testaceous, the anterior paler than the middle; palpi pale testaceous, tegulæ testaceous, wings hyaline, the nervures and stigma black. Flagellum of antennæ fuscous. ♂. Length, 5 mm.

Quop, Sarawak; October (John Hewitt).

Front strongly punctured, the vertex punctured on the sides and centre. Face aciculated, the clypeus punctured, its centre with an incision, which becomes gradually widened. Mandibles ferruginous at the apex. Basal half of pronotum sparsely weakly punctured, the meso- and scutellum sparsely but distinctly punctured; the postscutellum smooth. Metanotum with a strong lateral and a weak central keel, the space between strongly aciculated. Upper half of metapleuræ widely, not very strongly striated, the basal lower half aciculated, the apical weakly striated. Basal two abdominal segments glabrous, the others covered with pale pubescence; pygidium closely punctured, reddish at the apex. First abscissa of radius roundly

curved, nearly as long as the others, which are of equal length, oblique, the apical slightly curved at the apex; the second cubital cellule more than twice the width of the base at the apex, the recurrent nervure received near its apex. Temples short, obliquely roundly narrowed.

The known Bornean species of *Tiphia* should be known thus:—

- 1 (2) Wings fuscous violaceous; length, 15 mm. . . . *fumipennis*, Sm.
- 2 (3) Wings yellowish; the nervures and stigma testaceous; length, 10 mm. . . . *flavipennis*, Sm.
- 3 (2) Wings for the greater part hyaline.
- 4 (5) Length, 5-6 mm.; the nervures and stigma black; the four anterior tibiæ and tarsi testaceous; the abdominal pile pale *borneana*.
- 5 (4) Length, 10 mm.; the nervures pale testaceous; the legs black; the abdominal pile blackish. *stigma*, Sm.

NOTES AND OBSERVATIONS.

DENTON'S PATENT BUTTERFLY TABLETS.—We have received a sample of these tablets. The butterfly in it is a specimen of *Cethosia cyane*, from Assam. It is mounted in its air-tight case, to show the under side. Whilst speculating as to the practical use specimens treated in this way could be to the entomologist, the thought occurred that it might be a good plan to have a few of such tablets by one. Non-entomological friends often wish to make closer examination of specimens than it would be prudently admissible for them to do in the ordinary way, but enclosed in these cases the most fragile insect might be safely handled by the uninitiated.

SOME MEASUREMENTS OF SYMPETRUM SCOTICUM.—A series of the small black dragonfly, *S. scoticum*, obtained by us at the Black Pond, Surrey, on 20th September last, include two or three particularly small males. The smallest of them measures only 27.5 mm. in length and 42 mm. across the hind wings. This specimen affords an interesting contrast with a large male taken at the same place on 3rd September, 1906, the length of which is 38.5 mm. and the expanse 52 mm. F. W. & H. CAMPION; 33, Maude Terrace, Walthamstow, November 6th, 1907.

FOOD-PLANTS OF OPORABIA AUTUMNATA.—With reference to Mr. Harrison's interesting note (*antea*, p. 255), I may add that in my paper on "The Life History of *Oporabia autumnata*" (Trans. City Lond. Ent. Soc. ix. 42-52), I recorded as food-plants, fir (Doubleday, *teste* Guénée), and larch (Püngeler, *in litt.*), besides birch, alder, oak, sallow, aspen. Evidently, although having certain definite preferences, it can accommodate itself to almost anything, for in the same place I quote a record from Sparre Schneider to that effect; and in Part x. of the same Society's Transactions (p. 18), I record breeding a series from

larvæ found at Pontresina, by Dr. Chapman, on honeysuckle, alder, &c. Both Mr. Allen and myself have successfully reared it on hawthorn. Surely there is one slip in Mr. Harrison's note which needs correcting. He speaks of purple as "very often" appearing "in the larvæ of both *O. dilutata* and *O. autumnata*." According to Guenée, and to Mr. Allen's very wide experience (Ent. Rec. xvii. 339) and my own not inconsiderable, the larva of *O. autumnata* is never so adorned. The interesting new phase of coloration observed by Mr. Harrison is, as I understand him, something quite different.—LOUIS B. PROUT; 246, Richmond Road, N.E., November 1st, 1907.

THECLA PRUNI AB.—It may be of interest to record a curious aberration of *T. pruni* bred from a larva which I obtained in Huntingdonshire this year. The under side has, in place of the usual broken bluish white line, a complete series of pale blue bands joining the black spots on the inside of the orange band on the hind wings, and merging into the brown colour on the fore wings. These bands fill the space between the nervures with blue for about one-eighth of an inch on all the wings. The upper side is normal, except that the general colour is rather dingy for a bred specimen.—C. N. HUGHES; Knightstone, Cobham, Surrey.

MACROGLOSSA STELLATARUM FLYING ON SHIPBOARD FROM GIBRALTAR TO SUEZ.—I noticed a specimen of *M. stellatarum* flying around the ship just before getting to Gibraltar on October 1st. In the evening it settled in the dining saloon. I was going to secure it, when I noticed it had a snipped wing and so left it alone. The next day I saw the same specimen again, but what was my surprise after leaving Marseilles, where we had stayed a day and a-half, still to see the same insect, after which, with the assistance of Miss Fountaine, we kept a good look-out for it. Next we called at Naples and Port Said, but it was still with us. However, on the night of October 12th, after passing through the Suez Canal, Miss Fountaine informed me that it had met with an untimely death at the hands, or rather feet, of one of the stewards, after which we saw no more *M. stellatarum* up to the time of my leaving the boat at Aden.—W. FEATHER; care of British Somaliland Fibre and Development Company, Berbera, Somaliland, Africa.

TO PREVENT MOULD IN RELAXING-BOXES.—One day this summer, a bottle in which I kept oxalic acid having got shaken in travelling, I stood it in the somewhat mouldy lid of a relaxing-box while I killed some insects. I noticed next day that the mould had been removed by the oxalic incrustation on the bottle. Since then I have put a little oxalic into the silver sand into which I dump my killed insects till I have leisure to set them, so far as I know, with none but good results. I do not see that the oxalic, thus used, can damage the pins, since pricking the insect with it apparently has no such effect. Perhaps some entomologist with a knowledge of chemistry will tell us; the matter would seem to be of some interest, for a good method of preventing mould does not appear to be generally known.—H. V. PLUM; Lower School, The College, Epsom, November 14th, 1907.

PYRALIS LIENIGIALIS, Z., NEAR OXFORD.—When writing my note headed "Re-occurrence in Britain of *Pyralis lienigialis*, Z." (antea, p. 235), I had completely forgotten that an individual of this rare species had been recorded, in Ent. Mo. Mag., ser. 2, xiii., 273 (1902), as captured near Oxford on August 22nd, 1902, and exhibited by Mr. South at a meeting of the South London Entomological Society held on October 9th of that year. I have just come across my manuscript note, made in 1902, giving the reference to this record which shows that the insect has occurred in one English county besides Bucks. It is regrettable that the name of the captor is omitted, and especially so that the precise county in which the moth was taken is not specified, for "near Oxford" might refer equally well to part either of Berkshire or of Oxfordshire.—EUSTACE R. BANKS; Norden, Corfe Castle, November 17th, 1907.

NOTE ON THE NAME OF A CICADA.—The Central American species which Distant (Cat. Cicadidæ, p. 121) calls *Herrera marginella* is based on *Cicada marginella*, Walker, 1858; but it is not the *Cicada marginella*, Fab., Syst. Rhyng., p. 96. The synonym *Carineta ancilla*, Stål, 1864, is available, the species becoming *Herrera ancilla*.—T. D. A. COCKERELL.

OPIUSA LIANARDI AND ITS VARIETIES.—I think that a few remarks upon this extraordinary moth will be of some interest, especially, perhaps, to those who are acquainted with the species, and I shall be very glad to receive further notes from collectors or rearers of the moth. In Natal *O. lianardi* occurs usually about once in every three years, and then it simply swarms. What becomes of it in the interval has so far not been satisfactorily ascertained. It has been suggested that the larvae feed upon the flowers of a very common plant here called the buckweed, which only flowers every third year; but although I have very carefully looked for the larvae upon the flowers of this plant, I have never found it thereon. I feel certain that the buckweed is not the food-plant. The few larvae I have found were feeding upon the suckers growing on a tree that the hawk-moth, *Baniana postica*, feeds upon. I am unable to give the scientific name of this tree, as I believe that it has not yet been named. I am of opinion that *O. lianardi* is migratory, visiting us either from Portuguese Africa or Rhodesia, as in both places the moth occurs. It is chiefly remarkable from the fact that it flies commonly by day, and for the number of forms that it assumes. In a collection that I have before me there are fifty-seven specimens, all of which are different, and in at least twenty instances the difference is so great that almost anyone would think they belonged to some other species of *Ophiusa*. As a rule, however, the markings on the hind wings are constant, but in some instances the white markings are absent from them. In 1905 this moth was so common here as to be a nuisance, and from any grass at the sides of the roads in the town they flew up in numbers when disturbed. There must have been hundreds of thousands of them in Durban and its suburbs alone. I hear that the moth was just as common at Pietermaritzburg and all along the south coast as far as Park Rynnie, a distance of forty miles; a few, I am told, turned up in 1906, but the moth has not been seen since up to the end of August,

1907, and as the buckweed has been in flower this winter, it cannot be the food-plant, or *lianardi* would have turned up by now, as all the other *Ophiusa* species have been about for the last six weeks. It was common in 1902 and 1905, as previously mentioned, and I feel certain it will turn up again in 1908. I have had as many as thirty pupæ of the moth at one time, and all not ichneumoned have emerged within a month, so the moth, I think, cannot go over in the pupal state. There are several species that do go over from one year to the other in the pupal state, but they are chiefly Saturnids and Lasiocampidæ. Two Sphingidæ remain under the ground in the larval state for about eight months, whilst other larvae of the same moths change at once into pupæ; these are *Andriasa mutata* and *Nephela argentifera*. I have also had *Daphnis nerii* remain for over six months in the pupal state, but this is very unusual, as the larvae pupate upon the surface of the ground or in the dead leaves.—F. T. LEIGH; Durban, Natal, August 31st, 1907.

COLIAS EDUSA IN 1907.—Has *Colias edusa* really been so "unusually scarce this season" as Mr. Edward Goodwin's note (*antea*, p. 257) appears to suggest? The only likely opportunity that I had of making its acquaintance was while spending a portion of the month of September on the South Coast, and what I learned regarding the species during the earlier part of that time led me to think that, although it could hardly be regarded as common, it was far from being rare. The first I heard of it was a report by a friend, who had preceded me by a few days, that he had seen one flying over the downs below Beachy Head, on the 3rd of the month, and that two others had been noted at the mouth of the Cuckmere river at about the same date. On the 8th I captured one, and my brother another, in the same place as the first-mentioned specimen; on the 9th one was seen about a mile inland; on the 11th another, on the downs below Beachy Head; and, finally, I captured another, on the lower part of Seaford Head, on the 14th, thus accounting for eight specimens in all during possibly two or three hours' ramble on each of some twelve days. From what I was able to see of the individuals noted, I am inclined to regard them as probably being immigrants; this is, however, merely a matter of opinion, and it would be of interest to know whether other parts of the South Coast were similarly affected, or, indeed, whether the species has been noted in other places.—ROBERT ADKIN; Lewisham, November, 1907.

THE FOOD-PLANTS OF *PYRAMEIS CARDUI*.—Of the adaptive habit of the larvae of *Pyrameis cardui*, an interesting example was presented this year in the village of Binn, Valais. The ova of a brood evidently had been laid upon some nettles growing sparsely by the side of a châlet. These had all been consumed to the ground, or otherwise destroyed, before the larvae were half-fed, and they had betaken themselves *en masse* to the only other weed in the immediate neighbourhood, which happened to be a *Chenopodium*—a plant that I have not seen recorded as food for the species, though Mr. Buckler reared it successfully on *Malva sylvestris*, and Mr. W. H. S. Fletcher found it on *Echium vulgare* (Buckler's 'Larvæ of the British Butterflies, &c.'

vol. i. pp. 174-175); while Rühl gives, in addition to thistle, nettle, and milfoil, *Lappa officinalis* (burdock), *Gnaphalium* and *Parietaria*, *Filago arvensis*, *Nonnea pulla*, and, in the Lybian Desert, a kind of *Silybum*. M. André, in his recently published ' Catalogue of Butterflies of the Department of Saône-et-Loire,' mentions *Helichrysum arenarium*; M. Guenée cites *Eryngium* (' Lepid. of Eure-et-Loir'); M. Frionnet (Haute-Marne), artichoke. For Scandinavia, Professor C. Aurivillius gives mallow, and "several other plants" (names not given), besides nettles and thistles of various species.—H. ROWLAND-BROWN; Harrow Weald, October 19th, 1907.

ON THE DISCOVERY OF THE LARVA OF *TRICHOPTILUS PALUDUM*, ZELL.—Reading the Rev. Pickard-Cambridge's note on the discovery of the food-plant of *T. paludum* in the August number of the ' Entomologist,' I see he states that larvae were found in the Esher district by Dr. Chapman through a clue given by Mr. Eustace Banks, that *Drossera* was the food-plant of this insect. I should like, however, to state that I captured a specimen of *T. paludum* in the Esher district on August 27th, 1904, which I believe is the first record for Surrey, as stated in the November number of the ' Entomologist' for that year. I may suggest that it was by reason of this capture that Dr. Chapman and Mr. South visited the spot on the 31st May, 1905, and obtained larvæ there.—ARTHUR J. SCOLLIK; 8, Mayfield Road, Wimbledon, S.W., November, 1907.

THE LEPIDOPTERA OF GIBRALTAR.—Re Mr. Rowland-Brown's note on my list of the Lepidoptera of the Straits, I find that I have made no mistake about the months. I cannot account for the difference between my dates and those of other observers unless atmospheric conditions which, according to the Spaniards, had greatly affected the vegetation, had also affected the insects. But as this, to me, seems hardly probable, I think that on a fuller examination the insects I mention will be found there, on or about the dates on which I found them. As to the names, all my specimens were identified by comparison with others, and I think are all correct, but I should be very pleased to send Mr. Rowland-Brown any which he would care to verify. I might here state that a great many of my observations were made, I believe, much further afield than those of Commander Walker and most other English entomologists, notably at Gaucin and Benaoçaz.—F. W. SOWERBY, R.N.; Navigation School, Portsmouth.

"HOMING" INSTINCTS (?) OF HYBERNATING INSECTS.—Early in October, 1907, I found, in a room which I use as a lumber-room, a specimen of *Gonoptera libatrix*. This room is an attic, and has a window (kept open) opening on to one of the sloping sides of the roof. In it I keep empty boxes, picture cases, &c., and also my boxes containing larvæ and chrysalids. Wishing to observe the movements, if any, of hibernating moths, I put the *G. libatrix* into a gauze-covered box. Shortly afterwards I received definite orders to move to Aldershot on a certain date. Not wishing to take the moth with me, I waited until there came a warm moist evening, when I took it down stairs (two flights) and turned it out into my garden, which is on the opposite side of the house to the attic window. Some ten days after

turning the moth outside I began turning over my picture-boxes, preparatory to packing up, when, to my astonishment, there on a lid of a case which had been resting against the attic wall was the *libatrix*, back again! There was not the slightest doubt about its being the same moth. It was a perfect specimen, very clearly marked, only it had a large peculiarly shaped chip out of its left upper wing, which I had noticed when I first took the moth, and which I have seen almost daily for a fortnight, as I used to look at the moth in the evenings to see if moved according to the weather. I again put the moth outside, this time through the attic window. About a week after doing so I took all my picture-boxes out of the attic. On taking off the loose lid of the box where the moth had been, I discovered the same moth again, sitting on the same lid! I must explain that the lids and boxes were not attached, but were all placed in a pile resting against the wall, so there was plenty of room for the moth to creep inside the box on to the lid. This particular box, that the moth had twice selected, was of walnut-wood; the others were of deal. The insect might certainly have easily selected the same box twice, once it had entered the room, but how did it manage to find its way from the garden to the attic window round the other side of the house the first time I turned it out? There can be no question about its having been the same moth each time from the peculiar mark I have mentioned. At Camberley, about three years ago, I noticed somewhat the same thing. A specimen of *Gonepteryx rhamni* hibernated on the upper side of a leaf of a thick laurel-bush in my garden. The insect was not snowed on, as upper leaves protected it, but it certainly must have been frozen several times. It was quite visible to anybody standing near the bush, and who knew where to look for it. One day early in spring, when it was bright and sunny, my wife and I were in the garden near the bush, when the butterfly started off and flew about the garden. It then disappeared over a hedge. I saw it fly back and up and down several times in our garden. I then went away, and on returning about 4 p.m., on passing the laurel-bush, there was the insect back again, within six inches of its original resting-place! There it remained until spring really came, when it finally flew away. Of course I cannot vouch in this case that it was the identical butterfly, as there were no special marks on it, but the facts of the case all go to show that it was the same one.—(Capt.) B. TULLOCH; K. O. Yorkshire L. I., November 20th, 1907.

THE RAYNOR COLLECTION OF BRITISH LEPIDOPTERA.—From marked catalogues kindly lent by Mr. A. J. Scollick we are enabled to note some of the prices realized at the distribution of this collection, which was exceedingly rich in varieties of *Abraxas grossulariata* and a few other species.

First day's sale (October 22nd):—*Sesia culiciformis*, a specimen with extra orange band at base of the body ("var. or n. sp. ?"), sold for 50/-. A lot of nine specimens each of *H. jacobææ* and *C. dominula*, one of the former a variety with costal streak and apical spot united, brought in 32/6. Four nice varieties of *P. plantaginis* made 20/-, and a specimen of *A. villica* with dusky hind wings went for 26/-. Another example of *A. villica* with a large cream-coloured blotch covering apical

third of fore wings realized 27/6. Four unusually dark varieties of *A. caia*, sold in couples, made 22/- and 24/-. Of *Spilosoma lubricipeda*, "a remarkable fine rayed var. near *deschangei*," commanded three guineas, whilst a rather smaller and darker specimen only fetched 22/-; a fine example of var. *zatima* made 40/-, and one of var. *deschangei*, "entirely black, except thorax," 35/-. A pair of *Laelia caenosa* found a purchaser at 35/-, and a specimen of *Leucodonta bicoloria*, taken by Bouchard at Killarney, induced bidding up to £4 10s. Two specimens, male and female, of *D. sicula* produced 25/-. For some female varieties in a lot of ten specimens of *A. prunaria* there was competition, and these ultimately fell to the buyer of Bouchard's *bicoloria*, for £3 5s. A dark male of the same species, and a female with the outer half of the fore wings orange, brought in 32/6. A light orange female with the base of the fore wings and the anal angle of the hind wings slightly fuscous realized £2 5s.; an almost unicolorous brown male specimen made £3 15s.; two pairs of very large speckled varieties made three guineas per pair.

Of *Abraxas grossulariata* var. *lutea*, four specimens sold for from 28/- to 55/-, the total realized for the four being £8. Twenty other modifications of the same form made an average of about 5/6 each. One female specimen of ab. *nigrolutea* fetched 95/-, and another £6 10s. Three male examples of var. *fulvipicata* made 30/-, 32/6, and 60/- apiece; two females of the same, 21/- and 24/-, and five others from 7/- to 12/- each. Other tall prices for varieties of *A. grossulariata* were: a specimen of ab. *albomarginata*, 65/-; two of ab. *subviolacea*, 50/- and 55/-; a female of ab. *lactea sparsa*, 110/-; one of ab. *hazeleensis*, 40/-; three examples of ab. *nigrosparsata*, 45/-, 60/-, and 115/-. Some very nice examples of the *nigrosparsata* and other forms sold at more ordinary prices—from 5/- to 10/-. *Cidaria picata* var. *lacteomarginata* made 20/-. Among the *Strenia clathrata* were several dark and other interesting aberrations. Eight of the most fancied of these realized £13 16s. 6d., the prices ranging from 20/- to 57/6 each. Some of the less conspicuous but still desirable aberrations went for about a shilling apiece.

The following were the more striking items in the second day's sale (November 5th):—*Leucania flavicolor*, 5/- and 5/6 each; var. *rufa*, 6/6, 7/-, and 9/- each; var. *obscura*, 16/-. Two bred specimens of *L. vitellina* realized 26/-. Three examples of *Caradrina exigua* made 18/-, and the same price was given for each of two specimens of *C. xerampelina* var. *unicolor*. Of *Cucullia gnaphalii* there were six specimens, and these brought in a total of £3 7s. Six *Plusia orichalcea* sold for 12/-, and two specimens of *P. bractea* for the same amount. A nice little collection of Deltoids and Pyralidæ, offered in six lots, and comprising well over seven hundred specimens, only produced 33/-, whereas sixteen *Stenoptilia graphodactyla* (a recently discovered plume-moth) made 48/-. Seventy-six varieties of *Abraxas grossulariata* realized the large total of something over £100. The highest prices obtained being var. *chalcozona*, £4 10s.; var. *lacticolor*, £5 15s. and £4; var. *chalcobares*, £6; and var. *melanozona*, £6 10s.

CAPTURES AND FIELD REPORTS.

NOTES ON *NYSSIA LAPPONARIA*.—During the past two seasons I have been rather fortunate in finding nice long series of this rather local species along the Struan Road on the way to Kinloch. The moths are to be found in four different places along the road where bog-myrtle is abundant. I have obtained them near Blair Atholl, also about two hundred feet above the road on boggy parts of the hills, but I never found them away from bog-myrtle, and this would go to prove that this plant is the usual food of the larvae. Two weeks after I had ceased collecting them, a young man in Kinloch started to look for them, and he had got a fair lot. He did not say what he did with the males; but he had a box with about fifty females, which I gave him two shillings for. I then put them down on new ground; in fact, if this species is not removed away from Struan Road it will be ruined, as everyone about the place has come to know of it. A man put a box of them into the river at Kinloch, and no doubt the moths will be scarce on the Struan Road next year. Fortunately all the spots for *N. lapponica* in this district are not generally known. If I visit the locality next season, I think it would not be wrong of me to take all the females I can get on the Struan Road to safer ground, as it would be a pity to have this local species destroyed.—L. G. ESSON; 888, George Street, Aberdeen.

LEPIDOPTERA ON THE KENTISH COAST IN 1907.—I made a short visit to the Kentish coast in the vicinity of Deal on July 25th last, and found *Noctuae* in some numbers at sugar on the sand-hills; this was particularly the case with *Xylophasia sublustris*, of which species I counted sixteen on one sugared post, and over one hundred on my first round. They were accompanied by *Agrotis corticea*, *Miana literosa*, *X. monoglypha* (*polyodon*), and other common species. At the *Echium* flowers I saw *Agrotis vestigialis* and *tritici*, and also secured a nice series of *Nyctegretes achatinella*; the latter sitting quietly on the flowers allowed themselves to be boxed without trouble. *Lithosia luturella* (*pygmaeola*) were flying somewhat freely for them, the evening being warm, with only a slight breeze; but having met with this insect in plenty in the same locality in 1898, I did not work for them. On the following day I explored the sand-hills for a considerable distance, and was delighted at meeting with *Acidalia ochrata* for the first time alive. A few were taken, and two worn females deposited ova freely. The larvae emerged during the first week in August. I gave them *Galium verum* flowers to begin with, and when these could no longer be obtained, they took to the flowers of the golden-rod, a plant which I had fortunately growing in the garden. A fair number of the larvae are alive, and I hope to find them in the same condition after hibernation.—G. H. CONQUEST; 10, Meteor Road, Westcliff-on-Sea, October 29th, 1907.

ACIDALIA STRIGILARIA AT FOLKESTONE.—On July 24th, 1906, I had the good fortune to capture in Folkestone Warren a single female specimen of *Acidalia strigilaria*. She laid a few ova, and from these I reared nine perfect imagoes in July of this year. They were fed

throughout on *Clematis vitalba*, and I found them easy to rear. I understand this interesting insect is much rarer than formerly in the Warren, which is, I believe, its only known locality in the British Islands.—G. H. CONQUEST ; Westcliff-on-Sea, October 29th, 1907.

WYE VALLEY NOTES. CAPTURE OF *XYLINA FURCIFERA (CONFORMIS)*.—Last Easter, having decided to renew my acquaintance with the Wye Valley, I travelled to Chepstow on the evening of March 28th, and on the following day (Good Friday), there being no trains running on the Wye Valley line, walked the eleven miles to my quarters near Bigsweir. My chief object in visiting the district was to get some females of *Vanessa c-album*, and in this I was not disappointed. During Friday I saw four specimens of the butterfly, and captured one, and in the course of the next three days a fair number were seen, and three more taken. The species seems to be fairly well distributed up the valley from Chepstow to Monmouth. *Vanessa urticae* was common everywhere ; *V. io* and *Gonepteryx rhamni* rather less so. Of *V. polychloros* I saw two, both on the Gloucestershire side of the river. *Brephos parthenias* and *B. notha* were both taken in small numbers by watching in open spaces, as they fly low in such situations, and have a somewhat weak and fluttering flight.

The weather remained so hot just at this time that *Pieris rapae* was seen on March 31st, and several *P. napi* and *Euchloë cardamines* (males) on the following day. A large number of sallow bushes were visited on the three evenings of my stay, but a clear sky and a full moon prevented anything like a large bag. The scarcity of insects was, however, more than made up for by the capture of a male *Xylina furcifera (conformis)* on the 31st, which for a spring specimen is in very good condition. The identification of the specimen has been kindly confirmed by Dr. T. A. Chapman. A fine male *Pachnobia leucographa* was also taken on the same evening. Other species noticed at sallows were : *Tæniocampa gothica*, *T. incerta*, *T. stabilis*, *T. pulverulenta*, *Cerastis vaccinii*, *Scopelosoma satellitia*, and *Hybernia marginaria*.

On my return home I sleeved two of the *Vanessa c-album* on a currant bush, and put two in a cage with a supply of nettle-leaves. One of the former soon died, owing, I think, to one or two cold nights experienced just then, so I placed the survivor in the cage with the other two. A few ova were laid on April 2nd, and more at intervals on sunny days, until there were about one hundred in all. Some of these I distributed amongst friends. Of those I kept the first hatched on April 25th, and the last on May 28th. By June 8th two larvæ were hanging up, and the first pupated two days later. Thirty-five larvæ reached the pupal state, and from these I bred thirty-four perfect specimens, the remaining one being slightly crippled. The pupæ were kept indoors, and the butterflies emerged between June 23rd and July 23rd. A small portion were of the var. *hutchinsoni* form, and there is a good deal of variation in the under sides. I attempted to get a pairing in confinement in a large breeding-cage, but was not successful.

At Whitsuntide I again went down for a few days (May 17th-20th),

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but was not so fortunate in regard to weather. It was decidedly colder, especially at night, than it had been at Easter. By working along the railway and river-banks I secured a fair number of *Euclidia glyphica*, and also observed *Argynnis euphrosyne*, *Nisoniades tages*, *Syrichthus malva*, *Lycæna icarus*, *Euchloë cardamines*. A few strongly-marked *Pieris napi* were netted, but were all males.

By beating and searching, odd specimens of *Abraxas ulmata*, *Venilia maculata*, *Minoia murinata*, *Melanippe hastata*, *Ennychia octomaculata*, and others were taken. After dark I used to tramp the woods with an acetylene lamp, but captures were very few and far between, and only included such things as *Numeria pulveraria*, *Tephrosia punctularia*, *Cidaria suffumata*, *Epione advenaria*, and others not worthy of mention.—PHILIP J. BARRAUD; Bushey Heath, Herts, November 9th, 1907.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, November 6th, 1907.—Mr. E. Saunders, F.R.S., Vice-President, in the chair.—Mr. G. Arnold, University of Liverpool; Mr. H. Frederick D. Bartlett, of 113, Richmond Park Road, Bournemouth; Mr. John Claude Fortescue Fryer, B.A., of The Priory, Chatteris; Mr. C. W. Howard, of the Acting Government, Transvaal; Mr. Charles H. Mortimer, of Wigmore, Holmwood; Mr. R. F. H. Rosenberg, of 57, Haverstock Hill, London, N.W.; Mr. Harold Baker Sly, of Brackley Knoll Road, Sidecup, Kent; and Mr. Clement H. Pead, of Johannesburg and St. Leonards Road, Bexhill-on-Sea, were elected Fellows of the Society.—Mr. A. H. Jones brought for exhibition a specimen of the Longicorn beetle, *Acanthocinus adilis*, L., a common Rannoch species, found in Gray's Inn Road.—Dr. F. A. Dixey exhibited male and female specimens of a new *Pinacopteryx*, discovered by Mr. S. A. Neave in Northern Rhodesia. The female resembled that of *P. rubrobasalis*, but the male was quite distinct. Both sexes of *P. rubrobasalis* and the female sex of Mr. Neave's species were mimics of *Mylothris agathina*.—Mr. W. G. Sheldon showed a series of *Limenitis populi* and ab. *tremula* with intermediate forms taken this year at Laon (Aisne), and a series of *Chrysophanus hippothoë* from the same region, the females displaying a wide range of variation for so restricted a locality as that in which they were captured.—Mr. G. C. Champion exhibited a fully developed example of *Mesovelia furcata*, M. & R., from Slapton, S. Devon, and *Thamnotrizon cinereus* from Lynmouth, N. Devon.—Mr. A. Harrison and Mr. Hugh Main exhibited a case of *Aplecta nebulosa*, arranged to show the great range of variation of this species in Delamere Forest; with series from Epping Forest, North Cornwall, and the New Forest for comparison.—Mr. R. S. Mitford exhibited two male specimens of *Cryptocephalus bipunctatus*, taken by him at Niton in the Isle of Wight in July, 1907, Undercliff, observing that the two forms were well-known on the Continent, but that neither had been reported in Britain before. He also showed *Paracynus aeneus*, Germ., captured on the North Essex coast in June, 1898, thus establishing the claim of *P.*

aneus to be regarded as a British beetle; an example of the very rare *Lathrobium rufipenne*, taken by him at Niton, I. W., in July, 1906; and a specimen of the rare *Ceuthorrhynchus viduatus*, taken by him at Brading, I. W., in July, 1907; and a specimen of *Cis dentatus*, taken by him at Sandown, I. W., in July, 1906, hitherto unrecorded in Britain.—Mr. J. E. Collin communicated a paper “On a large series of Nycteribiidae, parasitic Diptera, from Ceylon.”—Dr. G. B. Longstaff, M.D., then read a paper “On some Butterflies taken in Jamaica,” and a paper “On some Butterflies of Tobago,” exhibiting a number of examples taken by himself in both localities to illustrate his remarks.—H. ROWLAND-BROWN, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—
October 10th, 1907.—Mr. R. Adkin, F.E.S., President, in the chair—
Dr. Chapman exhibited a specimen of *Dasychira pudibunda* from the Pyrenees, measuring $2\frac{3}{4}$ in. in expanse.—Mr. Moore, *Hipparchia semele*, showing considerable variation in ground colour on the under sides, and a small race of *Enodia hyperanthus*, both from Dunkirk sand-dunes, together with an example of *Danais plexippus* from Moose Jaw, Winnipeg.—Mr. Lucas, the rare fungus, *Clavaria inæqualis*, from Oxshott, and the specimens of *Hyles euphorbiæ* bred recently from pupæ found in Kew Gardens.—Mr. Tonge, *Ennomos fuscantaria* taken by him at Redhill on his way to the meeting.—Mr. L. W. Newman (1) a series of bred *Polia xanthomista* var. *nigrocincta* bred from N. Cornwall ova; (2) ova of *Ennomos fuscantaria* and *Cirrhædia xerampelina* in situ on ash twigs; (3) a long series of *E. autumnaria*, including a number of very fine bred dark brown forms.—Mr. Priske, a series of the local *Necrophorus mortuorum*, and an exceptionally large *Lucanus cervus*.—Mr. Adkin, a series of *Hyponomeuta cagnagelus* reared from an *Euonymus* shrub in his garden, and contributed notes; he also showed ova of *Tortrix pronubana*.—Dr. Hodgson, a *Theretra porcellus*, brilliantly coloured on the right side; while the left was only faintly coloured, and also a varied series of male and female *Polyommatus icarus* from Kent, Surrey, and Sussex.—Dr. Fremlin, two fine varieties of *Aglais urticæ*, of the same race as those previously shown by Mr. Newman.—Mr. McArthur, spiders with their snare and prey, mounted between two sheets of glass.—Mr. Turner, a series of *Colias phicomene* from the Engadine; and a number of Lepidoptera from Guethery, Cauterets and Gavarnie, including some extreme forms of *Pararge mæra*.—Messrs West, Tonge, Main, Dennis, and Lucas exhibited a considerable number of lantern slides.

October 24th.—The President in the chair.—Messrs. Harrison and Main exhibited a series of *Agrotis ashworthii* from larvæ collected in North Wales at Easter, including var. *virgata*.—Mr. Tonge, a series of *Calocampa vetusta* bred from Continental ova, and stereographs of the ova of *Ennomos fuscantaria* and of *Cirrhædia xerampelina* in situ on ash.—Mr. West (Greenwich), the Coleoptera, *Apion hookeri*, *A. confluens*, and *Ceuthorrhynchus rugulosus*, all taken near Erith on chamomile.—Mr. Simmons, living larvæ of *Eupithecia subfulvata*.—Mr. Main, ova of a “stick” insect, *Bacillus rossi*, which resemble a short-stalked seed.—Mr. R. Adkin, a bred series of *Melanippe galata* from ova obtained at Eastbourne, and read notes on the variation shown.—Mr. Turner,

leaves of birch showing the web, feeding gallery, and cocoons of the Hyponomeutid moth *Swammerdammia cäsiella* var. *griseo-capitella*, and read notes on the larval habits. He also exhibited (1) *Melanargia galathea*, var. *leucomelas* from Gavarnie, Pyrenees; (2) *Aricia agestis* var. *alpina* from St. Moritz, Engadine; (3) *Abraixas grossulariata*, a form with but few traces of yellow, and extended and coalesced black markings; (4) several *Polyommatus icarus* ab. *clara* from Effingham; (5) *Eupithecia oblongata* ab. *centralista* (?) bred from golden-rod, Woolwich; (6) dwarf *Malacosoma castrensis*, measuring only 24 mm. from Essex; and (7) *Anthrocera filipendulae*, with the sixth spot much reduced in size and brightness and very clearly divided by the dark nervure.—Mr. Grosvenor, long series of *Polyommatus corydon* and *P. bellargus* with much variation; a specimen of the latter species was without the usual discoidal spot on the under side.—Mr. Newman (1) long series of *Hypsipetes sordidata* (*elutata*) from various localities, showing much variation, including fine red forms; (2) another gynandromorphous *Amorpha populi*; and (3) two more of the abnormal race of *Aglais urticae*. He also recorded the occurrence in North Kent of black aberrations of *Oporabia dilutata* and *Cheimatobia brumata*.—Mr. Sich read a paper, "Collecting Lepidoptera on the Tannusberg." Hy. J. TURNER, Hon. Rep. Sec.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—October 1st, 1907.—Mr. H. M. Edelsten exhibited *Leucania turca*, bred from Brentwood ova; also ova of *Nonagria cannæ*, in situ, on *Typha*, the female being provided with special hooks enabling it to lift the natural folds in the cuticle and deposit the ova underneath.—Dr. G. G. C. Hodgson, *Melitaea artemis*, showing parallel variation in widely separated districts, such as Central Ireland and South Wales, Devon and South Wales, &c.; also sketches of *Hesperia thaumas* observed resting in the sun in the position assumed by *Thanaos tages* when at rest at night, and blooms of the lizard orchis found in Surrey.—Mr. L. W. Newman, a very variable series of *Vanessa urticae*, including specimens with the black costal blotches confluent.—Mr. L. B. Prout, *Dianthæcia luteago* var. *ficklini*, bred July 3rd, 1907, from larvæ found near Bude, end of July, 1906, feeding on roots of *Silene maritima*.—Mr. J. Riches, *Agrotis puta*, from North London, with fore wings suffused with dark brown.—Mr. L. A. E. Sabine, *Polia nigrocincta*, bred from North Cornwall larvæ reared on apple and sallow.

October 15th.—Mr. J. A. Clark exhibited *Bombyx calluna* male from Dulnaith Bridge, with usual pale bands suffused with brown ground-colour.—Mr. H. M. Edelsten, a dark red-brown form of *Canobia rufa* from Dorset.—Mr. T. H. L. Grosvenor, *Lycæna alexis* from Surrey and Aberdeen, those from the latter district being the larger, and being more intense in colour.—Dr. G. G. C. Hodgson, *Lycæna alexis* taken during 1907, showing an unusually large proportion of blue females.—Mr. A. W. Mera, *Himera pennaria* male, Brentwood, 1907, with bands on fore wings very close together and only faintly indicated.—Mr. L. W. Newman, *Ennomos autumnaria* bred from ova laid by typical female paired with melanic male from Dover, a fair number of the series being melanic; also a very large *Polia xanthomista*, bred from North Cornwall ova.—Mr. L. B. Prout, *Toxocampa craccæ* from

North Cornwall and North Devon, 1907, all being of the grey form, and showing no trace of the brownish coloration characteristic of specimens taken some years ago in the latter district.—Mr. R. G. Todd, a long series of *Nonagria arundinis*, Wicken, mid-June, 1907, Mr. C. J. Willsdon, *Leucania vitellina*, *L. putrescens*, and *Heliothis peltigera*, Torquay, 1907; also, on behalf of Mr. E. C. Goulton, a long and extraordinarily variable series of *Hypsipetes elutata*, bred from Surrey larvæ.—S. J. BELL. *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The opening meeting of the session was held at the Society's rooms in the Royal Institution, Liverpool, on October 21st, Mr. Wm. Mansbridge, Vice-President, in the chair.—Mr. A. E. Gibbs, F.L.S., F.E.S., of St. Albans, was elected a member of the Society.—This being the annual exhibitory meeting, many interesting insects were brought by the members.—Mr. B. H. Crabtree had a fine series of the local melanic form of *Boarmia repandata* from Penmaenmawr, the females especially showing the white blotches characteristic of this local race; *B. gemmaria* var. *perfumaria* from Manchester; varieties of *Angerona prunaria* from Monkswood; *Aplecta nebulosa* var. *robsoni* from Delamere Forest; *Agrotis ashworthii* from Penmaenmawr; and *Chariclea umbra* from Sidmouth.—Mr. Robert Tait, Jun., showed a number of local species, among them being a long series of *Agrotis ripæ* from South Wales coast; *A. ashworthii*, North Wales, a series captured at rest; *Hemerophila abruptaria*, the chocolate form, from the London district; *Lobophora viretata*, *Anticlea derivata*, and *Larentia salicata*, from Lake Side, Westmorland; *Dianthecia nana* and *Eupithecia jasioneata* from Abersoch.—Dr. William Bell had a drawer of beautifully preserved and mounted larvæ of Lepidoptera, in which he had been able to preserve the green coloration in such species as *Saturnia pavonia* and *Papilio machaon*, without recourse to artificial aid. Dr. Bell had also been able to dry the plants on which the larvæ were mounted, in their natural form and colour. The same member further exhibited a box of Wicken insects, which included *Spilosoma urticæ* and an example of *Tapinostola extrema* (*concolor*) from that district; varieties of *Arctia caia* and a dark specimen of *Ennomos alniaria* from Wallasey; and *Plusia moneta* from Surrey.—Mr. F. N. Pierce brought a drawer of minor varieties of *Abraixas grossulariata* from Wallasey.—Mr. Prince had a large number of insects representing his season's work at Wallasey and Witherslack, and contributed notes.—Mr. W. Mallinson showed a beautiful water-colour drawing of a larva of *Deilephila galii*, one of two found at Wallasey this year.—Mr. H. R. Sweeting exhibited *Lycæna bellargus* and var. *cærulea* from Eastbourne; *L. corydon* and var. *syngrapha* taken by himself in Surrey; a series of *Noctua castanea* and var. *neglecta* from Delamere; *N. glareosa* and *N. brunnea* also from Delamere; *Moma orion* from the New Forest.—Mr. W. Mansbridge, a long bred series of *Boarmia repandata* from Delamere; a bred series of *Odontopera bidentata* from Wakefield, including var. *nigra* and diaphanous specimens; series of *Nyssia lapponia*, *Anarta melanopa*, and *A. cordigera*, from Rannoch.

The usual monthly meeting of this Society was held in the Royal Institution, Colquitt Street, Liverpool, on November 18th, Mr. Wm.

Mansbridge, F.E.S., vice-President in the chair.—A lecture was delivered by Mr. F. N. Pierce, F.E.S., on "The Androconial scales of Butterflies." He explained that these scales were only found upon the males of the various species and were even in that sex uncertain. The lecturer instanced the entire absence of this kind of scale in the case of the large group of the Lycenidæ, in such species as had brown males. Mr. Pierce described a hitherto unobserved scale which he had discovered when examining the male of the brown argus butterfly (*Lycæna agestes*) which appeared to be not only confined to the "blues" but to a very small patch, consisting of a few of these new scales, on the under side of the fore-wings, at the extreme base of the inner margin. He also enumerated some of the theories put forward from time to time as to the utility of these androconials. The lecture was fully illustrated with micro photos of the actual scales, shown through the lantern. This very entertaining lecture was followed by a lengthy discussion, in which most of the members present took part. The following members exhibited Lepidoptera.—Mr. F. N. Pierce, specimens of the British Lycenidæ in illustration of his paper.—Mr. Wm. Mansbridge, a short series of *Pygæra curtula* from Ireland, one specimen showing failure of the brown scales at the tips of the fore-wings.—Mr. H. R. Sweeting bred series of the following from Delamere:—*Geometra papilionaria* and *Ellopia prosapiaria*; the latter showing the dusty greyish suffusion characteristic of the locality.—Dr. J. Cotton exhibited a lantern slide of several British Rhopalocera photographed by Lumière's recently perfected process—H. R. SWEETING and WM. MANSBRIDGE, Hon. Secs.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—October 21st, 1907.—Mr. G. T. Bethune-Baker, President, in the chair.—Arrochar Lepidoptera: Rev. C. F. Thornewell showed various Lepidoptera collected at Arrochar this year, including *Larentia tristata*, L., two specimens of a nice form, with cream-coloured ground and coffee-coloured markings. He said that in daylight the markings had quite a golden tinge. The extent of the markings was normal, excepting that the central band was restricted; there were also *L. adæquata* Blch. (*blandiata*, Hb.), and an unrecognized *Eupithecia*. *Bryophila*.—Mr. G. T. Fountain showed a long series of *perla*, F., and *muralis*, Forst., from many British localities, to illustrate the extent of their variability.—Gynandromorphs: Mr. Colbran J. Wainwright showed two specimens of *Platychirus albimanus*, F., from Sutton Park, which were quite extraordinary. They were melanic, one showing no trace of markings, and in different degrees they showed characters intermediate between those of the male and the female sexes. Strictly speaking, they were not gynandromorphs, as they did not display some parts with male characters, and other parts with female characters. They would be better described as females possessing certain characters approaching those normally possessed only by the males. The chief points were that the foreheads, though separated, were only half the width of those in normal females, and were similar to males in some details of form: the fore tarsi and tibiæ, normally single in the females, were in these widened in similar manner to those of males, but not so much (the two specimens differing much in degree). The genitalia outwardly

appeared feminine.—Palæarctic Parages: Mr. G. T. Bethune-Baker showed a nice collection of the genus *Pararge*, with various forms of *egeria*, L., *megæra*, L., *mara*, L., &c.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

Les Premiers Etats des Lépidoptères Français (Rhopalocères). Par M. C. FRIONNET. Pp. i-xi, 1-320. Paris: A. Hermann.

THE ever-increasing number of collectors who find an extended field for observation and capture in France will welcome a book dealing practically with the subject chosen by M. l'Abbe C. Frionnet. It is a pity, therefore, that the author had not confined himself entirely to the species indigenous to the titular region, instead of introducing those wholly outside it, or of accidental occurrence. He does not appear, moreover, to have had the advantage of referring to records of much of the good work in his special department done by British observers, and although the species—and they are many—which have actually passed through his hands are as fully described as purposes of identification require, M. Frionnet, for the rest, is content to copy from his predecessors, in several cases with indifferent results. We should have expected a better diagnosis and account of the early stages of *Lycæna arion*, for instance, than the fragmentary information quoted from Newman. Nor do we find more than the barest mention of the association of ants with the larva of Lycænid butterflies, without some note of which their life-history must necessarily remain imperfect and unintelligible. Neither *Neptis lucilla* nor *N. aceris* have established themselves west of the Alpes-Maritimes: an extremely doubtful record of Peyerimhoff's for Strasbourg is regarded as sufficient warranty for a transcription of *Vanessa xanthomelas*. According to M. Chrétien ('Le Naturaliste,' 1903, pp. 71-2), the larvæ of all the Erebidae except *E. pronoë* are known, but M. Frionnet is unable to furnish details of *mnestra*, *pharte*, *stygne*, *evias*, *scipio*, *epistygne*, *goante*, *gorgone*, or *gorge*. But we know how difficult it is to get thoroughly accurate descriptions, and in the search among local lists to light upon reliable records. The French catalogues, hidden away in the annals of Societies of mixed scientific aims, are generally most difficult of access. Large tracts of country, even in the most promising regions, have yet to be explored by native butterfly-hunters so far as we can gather. At least in periodical entomological literature they have left no trace of their excursions. It was hardly worth while, however, to recreate *Apatura metis*, Fr., into a species, and simply to mention that the larva resembles that of *A. ilia*; and for localities which should appeal most strongly to British collectors there are some very improbable entries retained, as it were, from the veritable "fathers of entomology." If *Argynnis pandora* ever occurred at Auxerre, in the midland department of the Yonne, it was surely introduced artificially; while the record from Cherbourg, an error of M. Nichollet's, was corrected long ago. And is it conceivable that a southern species like *Euchloë belemia* ever found its way, except out of a collector's box, to Morlaix, in Finistère, a department which, by reason of

its geographical position, possesses one of the poorest butterfly faunas in France? But apart from these unnecessary repetitions, M. Frionnet condenses much useful and new matter into the two hundred and thirteen notices which more than cover the splendidly diverse catalogue of France's butterflies, and we may hope that the tempting array will further encourage those who enjoy the opportunity of studying them at first-hand to supplement our knowledge alike of their earlier stages, and of the area of their distribution in Western Europe.

H. R.-B.

Some Moths and Butterflies and their Eggs. Gowan's Nature Books, No. 15. Pp. 8, 60 plates. London and Glasgow: Gowan & Gray.

We have here a little book, 6 in. \times 4 in., in paper cover, intended for the general public, but requiring notice also amongst entomologists. We have photographs of sixty species of Lepidoptera and their eggs, by Mr. A. E. Tonge, reproduced in half-tone, as perfectly as we are accustomed to see such work in our best Transactions and magazines. The half-tone process does not reproduce the minute sculpture of the eggs, as one would like, but it shows as much as one can see of the egg itself by aid of an ordinary hand-lens. We can detect nothing that is not scientifically accurate, and we admire the portraits of not a few of the imagines. The remarkable point about the book is its price, so much and such good material got up for sale amongst entomologists would probably be sold at 5s. or 10s. Here it is for 6d. The secret is that it is to be sold by the thousand on bookstalls and elsewhere. If we could make the usual scientific works as popular, we might get them as cheaply. Will this suggest to anyone to think furiously with practical result?

T. A. C.

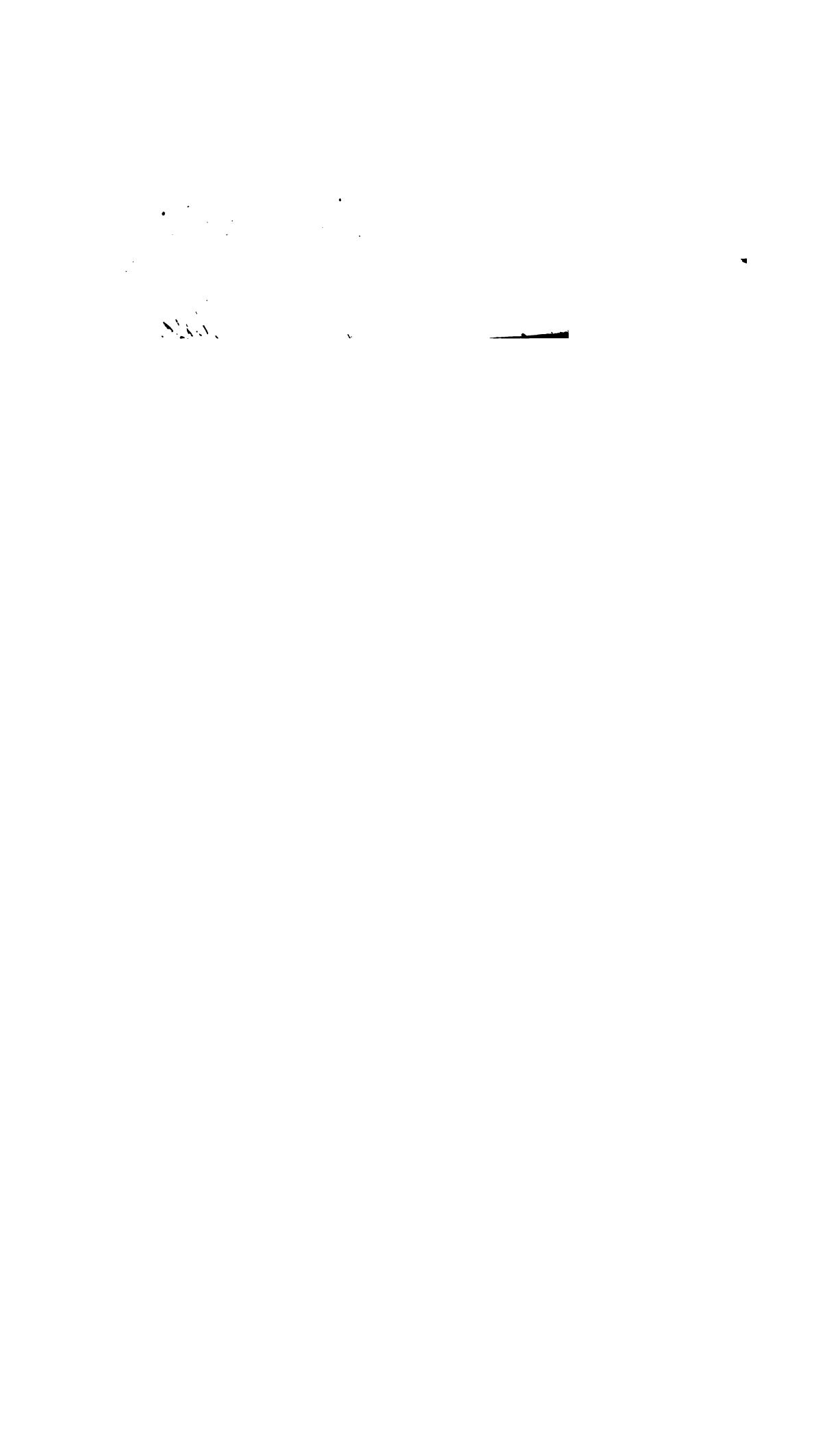
The Story of Insect Life. By W. PERCIVAL WESTELL, F.L.S., M.B.O.U. Pp. 1-339. London: Robert Culley, Paternoster Row, E.C. 1907.

THE first of the seven chapters into which the author has divided his subject comprises general remarks on the structure, metamorphosis, habits, &c., of insects. Chapters ii.-vi. deal respectively with Coleoptera, Orthoptera, Neuroptera, Hymenoptera, and Lepidoptera. The seventh and last chapter is devoted to Hemiptera and Diptera. Only some of the commoner species in each order are referred to, and these are just those insects that are most likely to come under the notice of rural dwellers or country ramblers. There are fifty figures of insects on the eight coloured plates, and a further sixty-two in black and white. Only ten species are shown in the larval stage, and of the egg stage we only find three examples. The story is pleasantly told, most of the illustrations are well done, and altogether the book is distinctly attractive.

OBITUARY.—We regret to learn that Mr. A. H. Shepherd, of 81, Corinne Road, died on October 26th last.



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